



# Illinois Environmental Protection Agency

Bureau of Water • 1021 N. Grand Avenue E. • P.O. Box 19276 • Springfield • Illinois • 62794-9276

## Division of Water Pollution Control ANNUAL FACILITY INSPECTION REPORT

### for NPDES Permit for Storm Water Discharges from Separate Storm Sewer Systems (MS4)

*This fillable form may be completed online, a copy saved locally, printed and signed before it is submitted to the Compliance Assurance Section at the above address. Complete each section of this report.*

Report Period: From March, 2015 To March, 2016

Permit No. ILR40 0664

#### MS4 OPERATOR INFORMATION: (As it appears on the current permit)

Name: VILLAGE OF TILTON

Mailing Address 1: 1001 TILTON ROAD

Mailing Address 2:

County: Vermilion

City: TILTON

State: IL

Zip: 61833

Telephone: 217-477-0800

Contact Person: DAVID PHILLIPS, MAYOR

Email Address: dphillips@tilton.com

(Person responsible for Annual Report)

#### Name(s) of governmental entity(ies) in which MS4 is located: (As it appears on the current permit)

VILLAGE OF TILTON, ILLINOIS

#### THE FOLLOWING ITEMS MUST BE ADDRESSED.

A. Changes to best management practices (check appropriate BMP change(s) and attach information regarding change(s) to BMP and measurable goals.) (See Attachment A)

1. Public Education and Outreach ☒

4. Construction Site Runoff Control ☒

2. Public Participation/Involvement ☒

5. Post-Construction Runoff Control ☒

3. Illicit Discharge Detection & Elimination ☒

6. Pollution Prevention/Good Housekeeping ☒

B. Attach the status of compliance with permit conditions, an assessment of the appropriateness of your identified best management practices and progress towards achieving the statutory goal of reducing the discharge of pollutants to the MEP, and your identified measurable goals for each of the minimum control measures. (See Attachment B)

C. Attach results of information collected and analyzed, including monitoring data, if any during the reporting period. (See Attachment C)

D. Attach a summary of the storm water activities you plan to undertake during the next reporting cycle (including an implementation schedule.) (See Attachment D)

E. Attach notice that you are relying on another government entity to satisfy some of your permit obligations (if applicable).

F. Attach a list of construction projects that your entity has paid for during the reporting period. (See Attachment F)

**Any person who knowingly makes a false, fictitious, or fraudulent material statement, orally or in writing, to the Illinois EPA commits a Class 4 felony. A second or subsequent offense after conviction is a Class 3 felony. (415 ILCS 5/44(h))**

Owner Signature:

DAVID PHILLIPS

Printed Name:

JUNE 1 - 2016

Date:

MAYOR

Title:

EMAIL COMPLETED FORM TO: [epa.ms4annualinsp@illinois.gov](mailto:epa.ms4annualinsp@illinois.gov)

or Mail to: ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

WATER POLLUTION CONTROL

COMPLIANCE ASSURANCE SECTION #19

1021 NORTH GRAND AVENUE EAST

POST OFFICE BOX 19276

SPRINGFIELD, ILLINOIS 62794-9276

This Agency is authorized to require this information under Section 4 and Title X of the Environmental Protection Act (415 ILCS 5/4, 5/39). Failure to disclose this information may result in: a civil penalty of not to exceed \$50,000 for the violation and an additional civil penalty of not to exceed \$10,000 for each day during which the violation continues (415 ILCS 5/42) and may also prevent this form from being processed and could result in your application being denied. This form has been approved by the Permit Management Center.

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# **ATTACHMENT A**

## **NARRATIVE REGARDING ADDITIONAL REQUIREMENTS OF REISSUED GENERAL NPDES IL R40 FOR MS4**

The Illinois Environmental Protection Agency reissued the General National Pollutant Discharge Elimination System (NPDES) ILR40 for the discharge of storm water from Small Municipal Separate Storm Sewer System (MS4). Additional requirements are to be achieved within 180 days of the effective date of the reissued General Permit from March 1, 2016. The following is a summary list of new items the Village intends to achieve in addition to the previously submitted Notice of Intent (NOI):

- Include this explanation in the Annual Report of additional tasks Village intends to achieve.
- Update the Village Storm Water Management website to include additional links to EPA websites regarding Best Management Practices, Climate Change, Environmental Justice and Total Maximum Daily Load (TMDL).
- Expand format of Village website regarding “WHAT YOU CAN DO AS A TILTON RESIDENT.” To include information regarding:
  - truck and car wash facilities in Tilton
  - request residents and businesses keep a lid closed on solid waste cans and dumpsters
- Update digital version of the Storm and Sanitary Sewer Base Map system to include:
  - Numbering of manhole and drainage outfall structures
  - Plot location of Village wash-down facilities also private truck and car wash facilities
  - Include new drainage facilities added to the Village
  - Include found drainage facilities found within Village & immediately upstream
- Monitor and inspect storm water management facilities by conducting visual inspection, photograph condition and document color, odor, clarity, floating solids, suspended solids, foam, oil sheen or other obvious indicators of storm water pollution at approximately 30 storm sewer outfall structures in Village and Grape Creek Bridges. Prepare photographic inspection report including suggestions and recommendations. Include measurement of facilities for addition to digital mapping systems.
- The Illinois State Map regarding Section 303(d) of the Clean Water Act lists the Vermilion River upstream, through and downstream of Tilton as “Medium” priority for Total Maximum Daily Load (TMDL) cause of polychlorinated biphenyls, mercury and

fecal coliform. Areas of Tilton drain to this river; consequently the Village consultant sampled discharge and testing from four storm sewer outfalls also immediately upstream and downstream of the Village along the river is being performed.

- **Prepare for and conduct public meeting presenting the Village Storm Water Management Plan, Website and Best Management Practices. Invite local school officials, contractors, public, Village staff and Trustees. This will be to update, train and educate regarding Tilton NPDES MS4.**
- **Review, revise and update Village Stormwater Ordinances to reflect requirements of the reissued General Permit.**
- **Review Village facilities by 1) inspections, 2) photography and 3) documentations. Then include Annual Reporting of the Village equipment wash-down system, salt storage, chemical & fertilizer storage areas, oil & fuel systems, street sweeping, Vector truck and solid waste operations. Provide improvement suggestions and recommendations Village if observed.**
- **Develop Process to assess the water quality impacts of flood control projects.**



**ATTACHMENT B**  
**Annual Facility Inspection Report**  
**MS4 PHASE 2 NPDES Permit No. IL400664**  
**Village of Tilton, Illinois**  
**(Reporting Period March 2015/2016)**

**2015/2016 MS4 PHASE 2 NPDES STORM WATER ACTIVITY SUMMARY**

BMP #	BMP	Category	Description	Status
A	Public education and outreach	A.1	Distributed paper material	Public education material posted on Village Storm Water Management website and available at Village Hall for interested public.
		A.5	Classroom education materials	The Village distributed public education and outreach material to interested public.
B	Public participation\involvement	B.2	Educational volunteer	The village providing education materials to local schools to raise awareness on types of storm water pollutants and information of type of green infrastructure and how they benefit in reducing such pollution through website.
		B.7	Other public involvement	Distribution of EPA flyers also Village posted educational material and flyerson web site.
C	Illicit discharge detection and elimination	C.1	Sewer map preparation	Gathered information of sanitary & storm sewers including location and size information then updated digital map. Hard copy of map plotted and posted at Public Works facility.
		C.3	Detection / Elimination Prioritization Plan	Continued observations of waste transportation through Village jurisdiction. Considering inspection of waste transportation equipment mobilizing through Village jurisdiction to identify any potential storm water pollution.
		C.4	Illicit Discharge Tracing Procedures	Flow meters placed in Village sanitary sewer lift stations and monitored during wet and dry periods. Reported results included on digital mapping.
		C.7	Visual dry weather screening	Preformed observation/screening of storm sewer outlets along Grape Creek & Vermilion River. Also observed conditions at bridges and culverts crossing Grape Creek
		C.10	Other Illicit Discharge Controls	Continued utilizing newly generated digital storm sewer map to generally develop plans to detain and treat run-off from major fire protection and/ or spill clean-ups. Open channels may be used in some areas to detain run-off water from fire fighting operations for treatment consideration.
D	Construction site runoff control	D.2	Erosion and Sediment Control BMPs	Emphasized erosion and sediment control requirements in the pre-construction meetings and then implemented on various projects.
E	Post-Construction runoff control	E.4	Pre-Construction Review of BMP Design	Inspection of erosion and sediment control measures are being conducted by the Village officials at pre and post-construction stages of the Village's construction projects.
F	Pollution Prevention / Good Housekeeping	F.1	Employee Training Program	Village Public Works personnel equipped with sewer video camera and location devises. Village Public Works personnel continue street sweeping and debris disposal also snow and ice control training.

**ATTACHMENT B**  
**Annual Facility Inspection Report**  
**MS4 PHASE 2 NPDES Permit No. IL400664**  
**Village of Tilton, Illinois**  
**(Reporting Period March 2015/2016)**

**2015/2016 MS4 PHASE 2 NPDES STORM WATER ACTIVITY SUMMARY - (CONTINUED)**

<b>BMP #</b>	<b>BMP</b>	<b>Category</b>	<b>Description</b>	<b>Status</b>
F	Pollution Prevention / Good Housekeeping	F.2	Inspection and Maintenance Program	Village staff swept streets. (See attached sweeping log) Cleared debris from drain facilities with Vactor Truck. Consulting engineer inspected Grape Creek for erosion control and debris build-up
		F.3	Municipal Operations Storm Water Control	Consulting engineer conducted visual inspections of streams in Village Jurisdiction for accumulated debris.
		F.4	Municipal Operations Waste Disposal	Village authorities identified and communicated locations for disposal of recyclables, landscape waste, street sweeping fines and garbage generated during clean-ups.
		F.5	Flood Management	Consulting engineer inspected Grape Creek through Village jurisdiction and identified debris build-up obstructing or potentially restricting channel and/or bridges for contractors and Village staff to implement mitigation. Inspected conditions during high water events this period. Considering additional measures to control flood waters. Village consultant evaluating benefits and burdens of potential participation in National Flood Insurance Program.

# ATTACHMENT C

Inspection Information & Monitoring Data

# GLEISNER ENGINEERING

217-213-2022

[josephgleisner@att.net](mailto:josephgleisner@att.net)

May 2016

**RE: MAY 2016 STORM SEWER & DRAINAGE INSPECTION  
PHOTOGRAPHIC REPORT, MONITORING OF SMALL  
MUNICIPAL SEPARATE STORM SEWER (MS4), VILLAGE OF  
TILTON, ILLINOIS**

**Photographs taken by Joseph J. Gleisner on May 20, 2016 unless noted otherwise. Structure numbering corresponds to Village Drainage Mapping System. Visually inspected facilities in good conditions unless noted.**



**FENCED, OVERGROWN STORM SEWER OUTLET AREA STRUCTURE # 5  
ON I-74 RIGHT OF WAY SOUTHEAST SIDE OF BALL PARK.  
COMMUNICATE WITH ILLINOIS DEPARTMENT OF TRANSPORTATION  
REGARDING CLEARING VEGETATION FROM ALL OUTLET STRUCTURES  
OBSTRUCTING FLOW AND SAFE INSPECTION ABILITY REGARDING THIS  
AND ALL DRAINAGE FACILITIES ALONG I-74 AND ILLINOIS ROUTE 1  
ADJACENT TO VILLAGE JURISDICTION.**



**RUST COLORED WATER UPSTREAM SIDE OF STORM STRUCTURE # 7 UNDER McVEY AVENUE EXTENDED. CULVERT IS 8-10 FOOT DIAMETER AND APPEARS OBSTRUCTED INSIDE**



**LOOK INTO UPSTREAM SIDE OF STORM STRUCTURE # 7 UNDER McVEY AVEUE EXTENDED. CULVERT IS 8-10 FOOT DIAMETER AND APPEARS OBSTRUCTED INSIDE**





**42" DIAMETER STORM OUTFALL STRUCTURE # 4 OBSTRUCTED WITH DUMPED DEMOLITION DEBRIS NEAR EAST END OF EAST 1st STREET, VIEW PRIOR TO CHANNEL OPENING**



**42" DIAMETER STORM OUTFALL STRUCTURE # 4 NEAR EAST END OF EAST 1st STREET VIEW AFTER CHANNEL OPENING**





**OBSTRUCTED 30" DIAMETER CULVERT UNDER RAILROAD SPUR,  
STORM STRUCTURE # 3 RESTRICTED WITH DEBRIS NORTH OF EAST 1st  
STREET PRIOR TO CHANNEL OPENING**



**STORM STRUCTURE # 3 AFTER DEBRIS REMOVAL EXPOSED BAR RACK  
ON 30" DIAMETER CULVERT UNDER RAILROAD. REGULARY INSPECT  
AND REMOVE DEBRIS.**



**OBSTRUCTED DRAINAGE CHANNEL PRIOR TO OPENING  
BETWEEN STORM STRUCTURES 3 & 4**



**DRAINAGE CHANNEL AFTER OPENING BETWEEN STORM  
STRUCTURES 3 & 4. ALLOW SOIL TO DRAIN THEN GRADE  
AND CONSIDER COORDINATING WITH ENGINEER AND  
PROPERTY OWNER TO ADD CULVERTS TO ALLOW  
EQUIPMENT ACCESS TO CLEAR DEBRIS ALLOWING PROPER  
FLOW CAPACITY**





**STORM OUTFALL STRUCTURE # 1 DOWNSTREAM SIDE OF  
30"DIAMETER CULVERT UNDER RAILROAD PRIOR TO  
VERMILION RIVER**



**STORM STRUCTURE # 9 NEAR SOUTHEAST END OF 2<sup>nd</sup>  
AVENUE OPENED AND FLOWING; CLEAR DEBRIS FROM  
OUTLET AND CUT REASONABLY ACCESSIBLE PATH FOR  
REGULAR INSPECTIONS**





**STORM STRUCTURE # 10 EAST OF NORTH F ST. & NORTH OF EAST 3<sup>rd</sup> STREET OPEN AND FLOWING; CLEAR DEBRIS FROM OUTLET AND CUT REASONABLY ACCESSIBLE PATH FOR REGULAR INSPECTIONS & MONITORING**



**STORM STRUCTURE OUTFALL # 12 FOR 14<sup>th</sup> STREET EAST HODGE STREET. MANY SOLID WASTE VEHICLES TRAVEL THIS SECTION OF 14<sup>th</sup> STREET TO AND FROM BRICKYARD LANDFILL**



**STORM STRUCTURE OUTFALL # 13 INTO HERSHEL LAKE. WATER POOL ELEVATION HIGHER THAN NORMAL**



**OUTFALL STRUCTURE # 14 NEAR HERSHEL LAKE; REGULARLY REMOVE DEBRIS FROM GRATE**





**STORM STRUCTURE # 35 AT SOUTH END OF LAKE TILTON  
SUBMERGED DUE TO POSSIBLE CLOGGING OR COLLAPSE**



**STORM OUTFALL STRUCTURE # 36 INTO GRAPE CREEK FROM  
TILTON LAKE; WATER FLOWING THROUGH BOTTOM OF  
CORRODED PIPE**





**FALLEN TREE COLLECTING SCUM AND TRASH ON GRAPE CREEK SLIGHTLY DOWNSTREAM OF LAKE TILTON OUTLET. COMMUNICATE WITH PROPERTY OWNER TO UTILIZE POOL LEAK RAKE SCREEN TO REMOVE TRASH AND SCUM FROM GRAPE CREEK**



**CATTLE GUARD SLIGHTLY UPSTREAM OF EAST ROSS LANE BRIDGE OVER GRAPE CREEK STORM STRUCTURE # 37 CATCHING TRASH & DEBRIS; COMMUNICATE WITH PROPERTY OWNER & FOR ACCESSIBILITY TO REGULARLY REMOVE TRASH & DEBRIS**



**STORM STRUCTURE # 16 DEBRIS OBSTRUCTING UPSTREAM OF TRIPLE BOX CULVERT UNDER GEORGETOWN ROAD / IL ROUTE 1 AT GRAPE CREEK; COMMUNICATE WITH ILLINOIS DEPARTMENT OF TRANSPORTATION TO REGULARLY CLEAR DEBRIS FROM CULVERT TO REDUCE IMPACTS OF TILTON FLOODING**



**STORM STRUCTURE # 16 DOWNSTREAM SIDE OF GRAPE CREEK CULVERT UNDER ROUTE 1**





**STORM STRUCTURE # 17 FLARED END SECTION JOINT DISCONNECTED  
SOUT OF SOUTHGATE DRIVE AND EAST OF ROUTE 1, CONSIDER  
IMPROVEMENT**



**STORM STRUCTURE # 18 DOWNSTREAM SIDE OF CSX RAILROAD  
BRIDGE AT GRAPE CREEK**





**STORM STRUCTURE # 19 DEBRIS UPSTREAM OF CSX RAILROAD BRIDGE AT GRAPE CREEK. REMOVE GARBAGE AND CONSIDER DOWNSTREAM FLOOD IMPACTS OF HYDRAULIC OPENING OF BRIDGE & OBTAIN RAILROAD PERMISSION. USE POOL EXTENSION POLE WITH LEAK RAKE SCREEN TO REMOVE GARBAGE AND SCUM FROM STREAM.**



**18" DIAMETER STORM OUTFALL STRUCTURE # 20 SOUTH OF COACHLIGHT MOBILE HOME PARK**





**STORM OUTLET STRUCTURE # 21 AT DITCH ALONG NORFOLK SOUTHERN RAILROAD WEST END OF PATTERSON STREET**



**STORM STRUCTURE # 22 KINGSDALE BRIDGE AT GRAPE CREEK**



**STORM STRUCTURE 23 UPSTREAM SIDE OF WEST ROSS LANE AND GRAPE CREEK CONSIDER HYDRAULICS OF BRIDGE & FLOOD IMPACTS OF OPENING**



**VIEW UPSTREAM OF STORM STRUCTURE # 23 SOUTH OF WEST ROSS LANE**





**INLET TO ROSS LANE STORM SEWER FROM CSX RAILROAD**



**CONTRACTOR INSTALLED SILT FENCE AT CONSTRUCTION  
ALONG ILLIANA DRIVE**



**STORM OUTFALL STRUCTURE # 33 INTO DETENTION BASIN  
SOUTHWEST OF ROSS LANE AND KING STREET**



**STORM OUTFALL STRUCTURE # 32 AT NORTH END OF NORTH 5<sup>th</sup>  
STREET**





**LOOK AT PARTIALLY OBSTRUCTED STORM OUTLET ON NIRTH END OF ADAMS STREET; RECOMMEND CLEARING OBSTRUCTION AND ALLOW PIPE TO OUTFLOW AT CAPACITY**



**LOOK AT 15" TILE ALONG RAILROAD UNDER I -74**



**LOOK AT DOWNSTREAM END OF CULVERT ALONG RAILROAD UNDER I-74**



**DEBRIS DEPOSIT UPSTREAM OF WASHINGTON STREET BRIDGE OVER GRAPE CREEK STORM STRUCTURE # 27, REMOVES DEBRIS DEPOSIT RESTRICTING STREAM**





**STORM OUTFALL STRUCTURE # 32 AT NORTHEAST CORNER OF  
WASHINGTON STREET BRIDGE AT GRAPE CREEK**



**STORM OUTFALL STRUCTURE # 34 AT NORTHWEST CORNER OF  
WASHINGTON STREET BRIDGE AT GRAPE CREEK**



**STORM STRUCTURE # 29, KING STREET BRIDGE OVER GRAPE CREEK**



**STORM OUTFALL STRUCTURE # 29 SLIGHTLY UPSTREAM OF KING STREET BRIDGE AT GRAPE CREEK**





**STORM OUTFALL STRUCTURE # 30 AT NORTHWEST CORNER OF KING STREET AT GRAPE CREEK**



**STORM OUTFALL STRUCTURE # 31 AT SOUTHEAST CORNER OF KING STREET BRIDGE AT GRAPE CREEK**

# GLEISNER ENGINEERING

217-213-2022

[josephgleisner@att.net](mailto:josephgleisner@att.net)

**RE: SOLID WASTE DUMPSTER PRELIMINARY REVIEW, MONITORING OF SMALL MUNICIPAL SEPARATE STORM SEWER (MS4), VILLAGE OF TILTON, ILLINOIS**

**Photographs taken of solid waste containers in the Village. Preventing liquid from entering & leaking from solid waste containers reduces stormwater pollution.**



**DUMPSTER WITH LID CLOSED PREVENTS RAIN WATER FROM MIXING WITH SOLID WASTE AND POLLUTING THE ENVIRONMENT**



**SOLID WASTE DUMPSTER WITH ROTTEN BOTTOM BEING HAULED FROM TILTON ALONG 5<sup>th</sup> STREET. PREVENT LIQUID LEAKING FROM SOLID WASTE CONTAINERS**

# GLEISNER ENGINEERING

217-213-2022

[josephgleisner@att.net](mailto:josephgleisner@att.net)

May 2016

**RE: VERMILION RIVER TMDL PHOTOGRAPHIC INSPECTION  
REPORT, SMALL MUNICIPAL SEPARATE STORM SEWER  
(MS4), VILLAGE OF TILTON, VERMILION COUNTY, ILLINOIS**

**Photographs taken by Joseph J. Gleinser, P.E. after rain event May 26,  
2016 during water sampling operation**



**Water sample test location #6 on Vermilion River near power line  
crossing upstream of Tilton, Illinois**





**Drainage ditch discharge into Vermilion River near abandoned General Motors site. Flexible pipe laying on ground along ditch**



**Upstream side of arched rail bridge over Vermilion River**



**Downstream side of arched rail bridge over Vermilion River**



**Tilton Waste Water Treatment Plant discharges into Vermilion River**





**Look at open ditch draining from Tilton into Vermilion River slightly downstream of Sewer Treatment discharge**



**Vermilion River test location # 5 slightly upstream of North Fork River**



**Upstream side of Illinois Route 1 Memorial Bridge over Vermilion River**



**Upstream of dam on Vermilion River near downstream of Tilton**





PDC Laboratories, Inc.  
2231 West Altorfer Drive  
Peoria, IL 61615  
(800) 752-6651



**SAMPLE RECEIPT ACKNOWLEDGMENT**

6054102

**Report To:**

Joseph Gleisner  
Gleisner Engineering  
327 Fletcher Drive  
Danville, IL 61832

Date Received: 05/26/16 15:37

Expected Date Due: 06/08/16 17:00

*We have received the sample(s) listed below and are proceeding with these analyses  
Please notify your Project Manager below if you have any questions or corrections*

PDC Lab #	Sample Description	Gleisner-Tilton SW	Joseph Gleisner-Tilton SW
6054102-01 1	Sampled 05/26/16 10:20		
Coliform Fecal MF	Hg 245.1	M8082	
6054102-02 2	Sampled 05/26/16 10:45		
Coliform Fecal MF	Hg 245.1	M8082	
6054102-03 3	Sampled 05/26/16 11:05		
Coliform Fecal MF	Hg 245.1	M8082	
6054102-04 4	Sampled 05/26/16 11:25		
Coliform Fecal MF	Hg 245.1	M8082	
6054102-05 5	Sampled 05/26/16 12:15		
Coliform Fecal MF	Hg 245.1	M8082	
6054102-06 6	Sampled 05/26/16 12:30		
Coliform Fecal MF	Hg 245.1	M8082	
Samples Received at: 20°C Custody Seals No Containers Intact Yes COC/Labels Agree Yes Received On Ice No			

PDC Project Manager: Janet Clutters - jclutters@pdclab.com Phone: 309-683-1743

Page 1 of 1

PDC Laboratories, Inc.  
2231 W. Altorfer Dr  
Peoria, IL 61615

# CHAIN OF CUSTODY RECORD

Phone: (800) 752-6651  
Fax: (309) 692-9689  
www.pdcclab.com

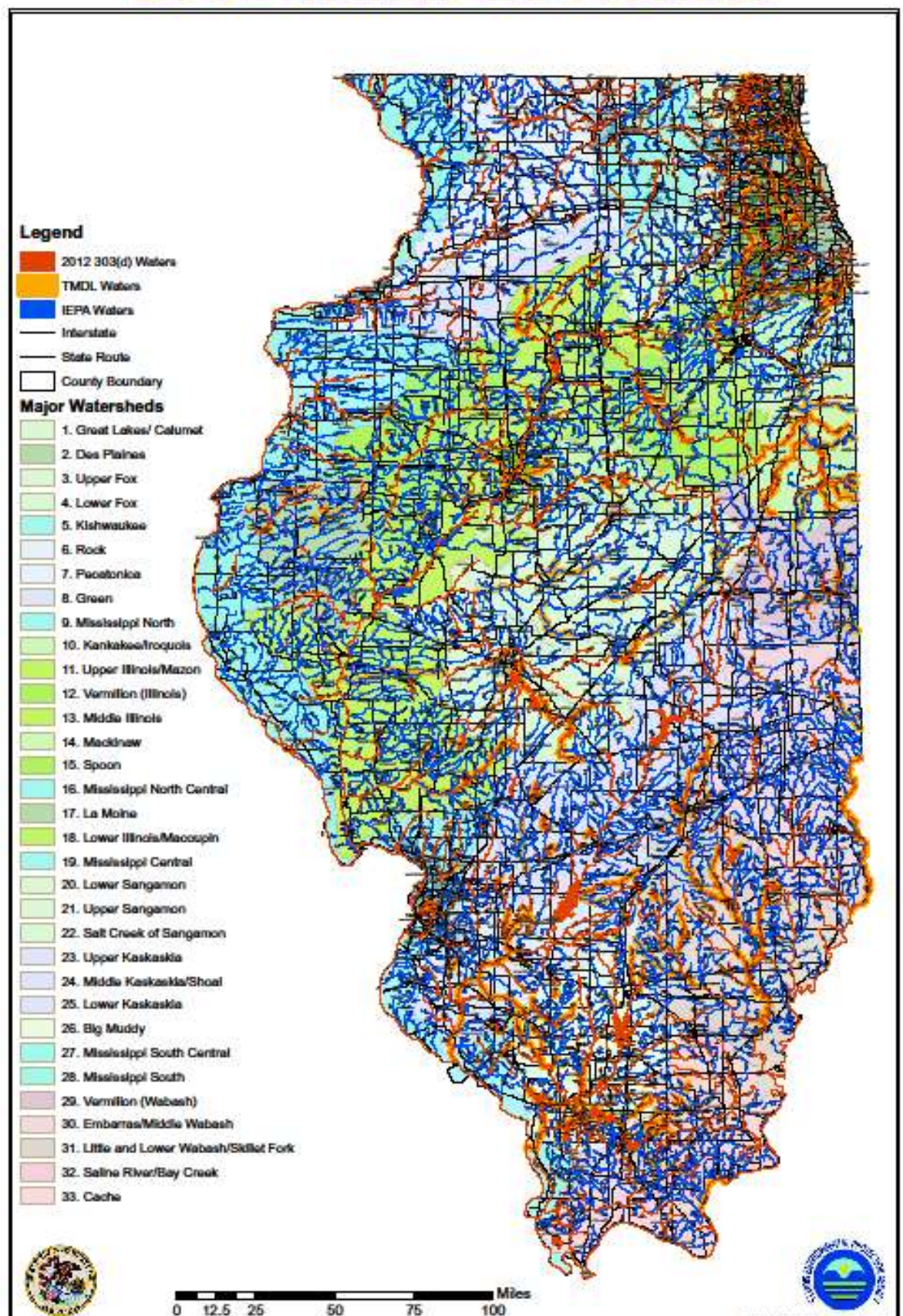
State where samples were collected IL

ALL HIGHLIGHTED AREAS MUST BE COMPLETED BY CLIENT (PLEASE PRINT)

CLIENT		P.O. NUMBER	PROJECT NAME	DATE SHIPPED	ANALYSIS REQUESTED		WORK ORDER (FOR LAB USE ONLY)
1			Tilton SW		3		4
ADDRESS	CITY	PHONE	EMAIL	MEANS SHIPPED			LOGIN #:
Gleisner Engineering 317 Fletcher Dr	Danville	(217) 213-2022	Josephgleisner@att.net				LOGGED BY: Tilton SW
STATE ZIP II 61832		SAMPLER (PLEASE PRINT)		MATRIX TYPES: WW - WASTE WATER DW - DRINKING WATER GW - GROUND WATER WWSL - SLUDGE NAS - SOLID LOHT - LEACHATE OTHER:			PROJECT: Janet Clutters
CONTACT PERSON Joseph Gleisner		SAMPLER'S SIGNATURE <i>Joseph Gleisner</i>					PROJ MGR: Janet Clutters
2		DATE COLLECTED	TIME COLLECTED	SAMPLE TYPE	COMP	BOTTLE COUNT	REMARKS
#1 @ NE Intersection of Ying & W. 13th St.	5/26/16	10:20am	X	SWWW		4	Rain this Morning (MH#25)
#2 @ E. 14th St. & Mayfield	5/26/16	10:45am	X	SWWW		4	Rain (Storm Structure #12)
#3 @ SE of Eldon & Mayfield	5/26/16	11:05am	X	SWWW		4	Rain (Storm Structure #26)
#4 @ NE Linden & N.F. St.	5/26/16	11:25am	X	SWWW		4	Rain (Storm Structure #16)
#5 Vermilion River	5/26/16	12:15 pm	X	SWWW		4	Upstream of Tilton River
#6 Vermilion River	5/26/16	12:30 pm	X	SWWW		4	Upstream of Tilton @ Power Line
5		TURNAROUND TIME REQUESTED (RUSH TAT IS SUBJECT TO APPROVAL AND SURCHARGE)		DATE RESULTS NEEDED	6	The sample temperature will be measured upon receipt at the lab. By initiating this area, you request that we notify you before proceeding with analysis if the sample temperature is outside of the range of 0-16°C. By not initiating this area, you allow the lab to proceed with analytical testing regardless of the sample temperature	
7		RECEIVED BY (SIGNATURE) <i>Joseph Gleisner</i>		DATE	5/26/16	8	
RELINQUISHED BY (SIGNATURE)		TIME	3:37pm	DATE		COMMENTS (FOR LAB USE ONLY)	
RELINQUISHED BY (SIGNATURE)		DATE		DATE		SAMPLE TEMPERATURE UPON RECEIPT	
RELINQUISHED BY (SIGNATURE)		DATE		DATE		CHILL PROCESS STARTED PRIOR TO RECEIPT	
RELINQUISHED BY (SIGNATURE)		DATE		DATE		SAMPLE(S) RECEIVED ON ICE	
RELINQUISHED BY (SIGNATURE)		DATE		DATE		PROPER BOTTLES RECEIVED IN GOOD CONDITION	
RELINQUISHED BY (SIGNATURE)		DATE		DATE		BOTTLES FILLED WITH ADEQUATE VOLUME	
RELINQUISHED BY (SIGNATURE)		DATE		DATE		SAMPLES RECEIVED WITHIN HOLD TIME(S)	
RELINQUISHED BY (SIGNATURE)		DATE		DATE		(EXCLUDES TYPICAL FIELD PARAMETERS)	
RELINQUISHED BY (SIGNATURE)		DATE		DATE		DATE AND TIME TAKEN FROM SAMPLE BOTTLE	



## 2012 Illinois EPA Waters









Appendix A-2. Illinois' 2016 303(d) List (sorted by name)

Order	Priority	Hydrologic Unit Code	Water Name	Assessment ID	Water Size*	Designated Use	Cause
1577	Low	0712000303	Thorn Creek	IL_H3D-06	2.21	Primary Contact Recreation	Fecal Coliform
1578	Low	0712000303	Thorn Creek	IL_H3D-06	2.21	Aquatic Life	Oxygen, Dissolved
2438	Low	Lake Michigan Beaches	Thornville Beach	IL_QN-03	0.69	Fish Consumption	Mercury
2439	Low	Lake Michigan Beaches	Thornville Beach	IL_QN-03	0.69	Fish Consumption	Polychlorinated biphenyls
2545	Low	0712000611	TIMBER LAKE (SOUTH)	IL_RT2Q	61.00	Aesthetic Quality	Phosphorus (Total)
2546	Low	0712000611	TIMBER LAKE (SOUTH)	IL_RT2Q	61.00	Aesthetic Quality	Total Suspended Solids (TSS)
866	Medium	0712000934	Tinley Creek	IL_HF-01	9.49	Aquatic Life	Cause Unknown
2414	Low	Lake Michigan Beaches	Touhy (Leone) Beach	IL_QN-01	0.41	Fish Consumption	Mercury
2415	Low	Lake Michigan Beaches	Touhy (Leone) Beach	IL_QN-01	0.41	Fish Consumption	Polychlorinated biphenyls
2540	Low	0712000611	TOWER LAKE	IL_RT2P	69.00	Recreation	Fecal Coliform
2541	Low	0712000611	TOWER LAKE	IL_RT2P	69.00	Aesthetic Quality	Phosphorus (Total)
2542	Low	0712000611	TOWER LAKE	IL_RT2P	69.00	Aesthetic Quality	Total Suspended Solids (TSS)
2390	Low	Lake Michigan Beaches	Town Beach	IL_QK-06	1.17	Fish Consumption	Mercury
2391	Low	Lake Michigan Beaches	Town Beach	IL_QK-06	1.17	Fish Consumption	Polychlorinated biphenyls
47	High	0714000208	Town Creek	IL_QK-02	7.02	Aquatic Life	Sedimentation/Siltation
48	High	0714000208	Town Creek	IL_QK-02	2.04	Aquatic Life	Phosphorus (Total)
26	High	0714000401	Trenton Creek	IL_OHF-TR-A1	1.30	Aquatic Life	Cause Unknown
27	High	0714000401	Trenton Creek	IL_OHF-TR-A1	0.97	Aquatic Life	Phosphorus (Total)
28	High	0714000401	Trenton Creek	IL_OHF-TR-A1	0.97	Aquatic Life	Sludge
29	High	0714000401	Trenton Creek	IL_OHF-TR-A1	2.03	Aquatic Life	Phosphorus (Total)
115	High	0714000405	Troy Creek	IL_ODMA-TR-C3	0.30	Aquatic Life	Phosphorus (Total)
2533	Low	0712000610	TURNER	IL_VT2A	43.00	Aesthetic Quality	Phosphorus (Total)
2534	Low	0712000610	TURNER	IL_VT2A	43.00	Aesthetic Quality	Total Suspended Solids (TSS)
307	Medium	0712000804	TURN TUNNEAD	IL_RHS	12.00	Aesthetic Quality	Phosphorus (Total)
1257	Medium	0712000612	Under Creek	IL_D12P-02	14.40	Primary Contact Recreation	Fecal Coliform
1062	Medium	0712000406	Union Ditch	IL_GGC-FN-A1	4.08	Aquatic Life	Oxygen, Dissolved
1063	Medium	0712000406	Union Ditch	IL_GGC-FN-A1	4.08	Aquatic Life	Sedimentation/Siltation
1064	Medium	0712000406	Union Ditch	IL_GGC-FN-C1	1.23	Aquatic Life	Ammonia (Total)
1065	Medium	0712000406	Union Ditch	IL_GGC-FN-C1	1.23	Aquatic Life	Chloride
1066	Medium	0712000406	Union Ditch	IL_GGC-FN-C1	1.23	Aquatic Life	Oxygen, Dissolved
1067	Medium	0712000406	Union Ditch	IL_GGC-FN-C1	1.23	Aquatic Life	Phosphorus (Total)
1068	Medium	0712000406	Union Ditch	IL_GGC-FN-C1	1.23	Aquatic Life	Sedimentation/Siltation
1747	Medium	0512010903	Upper Salt Fork Drainage Ditch	IL_BPG-01	24.05	Aquatic Life	Oxygen, Dissolved
1748	Medium	0512010903	Upper Salt Fork Drainage Ditch	IL_BPG-01	24.05	Aquatic Life	pH
1749	Medium	0512010903	Upper Salt Fork Drainage Ditch	IL_BPG-01	24.05	Aesthetic Quality	Phosphorus (Total)
1750	Medium	0512010903	Upper Salt Fork Drainage Ditch	IL_BPG-01	24.05	Aquatic Life	Phosphorus (Total)
1592	Medium	0709000408	U-Trib Kishwaukee River	IL_PQ2B	2.92	Aesthetic Quality	Ethanol
1591	Medium	0709000408	U-Trib Kishwaukee River	IL_PQ2B	2.92	Aquatic Life	Ethanol
2562	Medium	0712000906	U-Trib Moccasin Fork Sugar Creek	IL_H00B-01	0.31	Aquatic Life	Oxygen, Dissolved
1915	Medium	0712000706	U-Trib Mud Creek West	IL_H10B-01	15.50	Aquatic Life	Oxygen, Dissolved
1916	Medium	0712000706	U-Trib Mud Creek West	IL_H10B-01	15.50	Aquatic Life	Sedimentation/Siltation
935	Medium	0712000401	VALLEY	IL_RG2M	15.00	Aesthetic Quality	Phosphorus (Total)
937	Medium	0712000401	VALLEY	IL_RG2M	15.00	Aesthetic Quality	Total Suspended Solids (TSS)
127	High	0714000206	VANDALLA	IL_BOD	660.00	Fish Consumption	Mercury
128	High	0714000206	VANDALLA	IL_BOD	660.00	Aesthetic Quality	Total Suspended Solids (TSS)
2118	Medium	0512010908	VERMILION	IL_RHD	378.00	Fish Consumption	Mercury
2119	Medium	0512010908	VERMILION	IL_RHD	378.00	Aquatic Life	Oxygen, Dissolved
1837	Medium	0512010909	Vermilion River	IL_DP-01	4.98	Primary Contact	Fecal Coliform
1838	Medium	0512010909	Vermilion River	IL_DP-01	4.98	Fish Consumption	Mercury

Order	Priority	Hydrologic Unit Code	Water Name	Assessment ID	Water Use	Designated Use	Cause
1879	Medium	051011000	Vermilion River	IL BP-0	1.98	Fish Consumption	Polychlorinated Biphenyls
1880	Medium	051010000	Vermilion River	IL BP-0	5.97	Fish Consumption	Polychlorinated Biphenyls
1881	Medium	051011000	Vermilion River	IL BP-0	5.99	Fish Consumption	Mercury
1882	Medium	051011000	Vermilion River	IL BP-0	5.99	Fish Consumption	Polychlorinated Biphenyls
2217	Medium	071900200	Vermilion River	IL BP-0	14.11	Fish Consumption	Mercury
3728	Low	071900200	Vermilion River	IL BP-0	14.11	Recreation	Lead
3729	Low	071900200	Vermilion River	IL BP-0	14.11	Public and Food Processing Water	Nitrogen, Nitrate
7284	Medium	071900200	Vermilion River	IL BP-0	26.38	Recreation	Fecal Coliforms
7285	Medium	071900200	Vermilion River	IL BP-0	26.38	Fish Consumption	Mercury
2342	Low	071900300	Vermilion River	IL BP-0	16.79	Supplies	Nitrogen, Nitrate
2343	Medium	071900300	Vermilion River	IL BP-0	88.50	Aesthetic Quality	Total Suspended Solids (TSS)
2344	Low	071900300	Vermilion River	IL BP-0	16.79	Public and Food Processing Water	Supplies
2345	Low	071900300	Vermilion River	IL BP-0	16.79	Supplies	Nitrogen, Nitrate
2346	Low	071900300	Vermilion River	IL BP-0	16.79	Supplies	Total Suspended Solids (TSS)
2347	Low	071900300	Vermilion River	IL BP-0	16.79	Supplies	Nitrogen, Nitrate
2348	Low	071900300	Vermilion River	IL BP-0	16.79	Supplies	Total Suspended Solids (TSS)
2349	Low	071900300	Vermilion River	IL BP-0	16.79	Supplies	Nitrogen, Nitrate
2350	Low	071900300	Vermilion River	IL BP-0	16.79	Supplies	Total Suspended Solids (TSS)
2351	Low	071900300	Vermilion River	IL BP-0	16.79	Supplies	Nitrogen, Nitrate
2352	Low	071900300	Vermilion River	IL BP-0	16.79	Supplies	Total Suspended Solids (TSS)
2353	Low	071900300	Vermilion River	IL BP-0	16.79	Supplies	Nitrogen, Nitrate
2354	Low	071900300	Vermilion River	IL BP-0	16.79	Supplies	Total Suspended Solids (TSS)
2355	Low	071900300	Vermilion River	IL BP-0	16.79	Supplies	Nitrogen, Nitrate
2356	Low	071900300	Vermilion River	IL BP-0	16.79	Supplies	Total Suspended Solids (TSS)
2357	Low	071900300	Vermilion River	IL BP-0	16.79	Supplies	Nitrogen, Nitrate
2358	Low	071900300	Vermilion River	IL BP-0	16.79	Supplies	Total Suspended Solids (TSS)
2359	Low	071900300	Vermilion River	IL BP-0	16.79	Supplies	Nitrogen, Nitrate
2360	Low	071900300	Vermilion River	IL BP-0	16.79	Supplies	Total Suspended Solids (TSS)
2361	Low	071900300	Vermilion River	IL BP-0	16.79	Supplies	Nitrogen, Nitrate
2362	Low	071900300	Vermilion River	IL BP-0	16.79	Supplies	Total Suspended Solids (TSS)
2363	Low	071900300	Vermilion River	IL BP-0	16.79	Supplies	Nitrogen, Nitrate
2364	Low	071900300	Vermilion River	IL BP-0	16.79	Supplies	Total Suspended Solids (TSS)
2365	Low	071900300	Vermilion River	IL BP-0	16.79	Supplies	Nitrogen, Nitrate
2366	Low	071900300	Vermilion River	IL BP-0	16.79	Supplies	Total Suspended Solids (TSS)
2367	Low	071900300	Vermilion River	IL BP-0	16.79	Supplies	Nitrogen, Nitrate
2368	Low	071900300	Vermilion River	IL BP-0	16.79	Supplies	Total Suspended Solids (TSS)
2369	Low	071900300	Vermilion River	IL BP-0	16.79	Supplies	Nitrogen, Nitrate
2370	Low	071900300	Vermilion River	IL BP-0	16.79	Supplies	Total Suspended Solids (TSS)
2371	Low	071900300	Vermilion River	IL BP-0	16.79	Supplies	Nitrogen, Nitrate
2372	Low	071900300	Vermilion River	IL BP-0	16.79	Supplies	Total Suspended Solids (TSS)
2373	Low	071900300	Vermilion River	IL BP-0	16.79	Supplies	Nitrogen, Nitrate
2374	Low	071900300	Vermilion River	IL BP-0	16.79	Supplies	Total Suspended Solids (TSS)
2375	Low	071900300	Vermilion River	IL BP-0	16.79	Supplies	Nitrogen, Nitrate
2376	Low	071900300	Vermilion River	IL BP-0	16.79	Supplies	Total Suspended Solids (TSS)
2377	Low	071900300	Vermilion River	IL BP-0	16.79	Supplies	Nitrogen, Nitrate
2378	Low	071900300	Vermilion River	IL BP-0	16.79	Supplies	Total Suspended Solids (TSS)
2379	Low	071900300	Vermilion River	IL BP-0	16.79	Supplies	Nitrogen, Nitrate
2380	Low	071900300	Vermilion River	IL BP-0	16.79	Supplies	Total Suspended Solids (TSS)
2381	Low	071900300	Vermilion River	IL BP-0	16.79	Supplies	Nitrogen, Nitrate
2382	Low	071900300	Vermilion River	IL BP-0	16.79	Supplies	Total Suspended Solids (TSS)
2383	Low	071900300					



# GLEISNER ENGINEERING

217-213-2022

[josephgleisner@att.net](mailto:josephgleisner@att.net)

May 2016

**RE: TILTON PUBLIC WORKS FACILITY INSPECTION  
PHOTOGRAPHIC REPORT, SMALL MUNICIPAL SEPARATE  
STORM SEWER (MS4), VILLAGE OF TILTON, ILLINOIS**



**VILLAGE STREET SWEEPER IN PUBLIC WORKS GARAGE WASH DOWN FACILITY**



**20 FEET DIAMETER BASE BY 15 FEET HEIGHT OR APPROXIMATELY 60  
CUBIC YARDS OF STREET SWEEPING**

Log

Sweeper

TILTON 2016

Location	Driver	Date	Status
5th St.	DM	3-10	✓
L St.	DM	3-10	✓
G St.	DM	3-10	✓
CLAREDALE ST.	DM	3-10	✓
1st	DM	3-10	✓
2nd	DM	3-10	✓
EMERSON BRIDGE	DM	3-10	✓
CATLIN TILTON RD.	DM	3-10	✓
14th St.	DM	3-10	✓
3rd St.	DM	4-11	✓
4th St.	DM	4-11	✓
G St.	DM	4-11	✓
MEYERS	DM	4-11	✓
EMERSON	DM	4-11	✓
5th St.	TG	5-6	✓
L St.	TG	5-6	✓
1st St.	TG	5-6	✓
2nd St.	TG	5-6	✓
14th St.	TG	5-6	✓
ROSSLAND	TG	5-6	✓
KING ST.	TG	5-6	✓
G St BRIDGE	TG	5-6	✓
BLACK BRIDGE	TG	5-6	✓
KING ST	TG	5-6	✓

Notes:





**TILTON VACTOR TRUCK IN PUBLIC WORKS GARAGE. USED TO CLEAN AND MAINTAIN VILLAGE SEWER SYSTEM**



**TILTON END LOADER PLACING SOLID WASTE IN DUMPSTER AT PUBLIC WORKS FACILITY. TIRES & PALLETS FOR RECYCLING**



**CHEMICAL STORAGE AREA IN TILTON PUBLIC WORKS GARAGE**



**CHEMICAL STORAGE AREA IN TILTON PUBLIC WORKS GARAGE  
WESTERLY AT DIESEL AND GASOLINE STORAGE  
AND DISPENSING AREA AT TILTON PUBLIC WORKS FACILITY**





**VIEW OF MOTOR OIL CONTAINMENT FOR RECYCLING ALSO  
FLAMABLE FUEL STORAGE CONTAINERS AT PUBLIC WORKS  
GARAGE**



**VIEW EASTERLY AT FUEL STORAGE & DISPENSING AREA  
AT PUBLIC WORKS FACILITY**



**VILLAGE ROAD SALT STORAGE SHED**



# GLEISNER ENGINEERING

217-213-2022

[josephgleisner@att.net](mailto:josephgleisner@att.net)

May 2016

**RE: INSPECTION OF DRAINAGE FACILITIES IMMEDIATELY  
UPSTREAM OF TILTON PHOTOGRAPHIC REPORT,  
MONITORING OF SMALL MUNICIPAL SEPARATE STORM  
SEWER (MS4), VILLAGE OF TILTON, VERMILION COUNTY,  
ILLINOIS**

**Photographs taken by Joseph J. Gleisner on May 20, 2016 unless noted  
otherwise.**



**VIEW OF GRAPE CREEK FROM WEST ROSS LANE BRIDGE**



**BRIDGE OVER WEST ROSS LANE AT GRAPE CREEK**



**UPSTREAM SIDE OF CULVERTS UNDER NORFOLK SOUTHERN  
RAILROAD**





**LOOK AT DEBRIS UPSTREAM SIDE OF CULVERTS UNDER NORFOLK SOUTHERN RAILROAD AND GRAPE CREEK**



**DOWNSTREAM SIDE OF CULVERTS UNDER NORFOLK SOUTHERN RAILROAD OF TILTON**



**VIEW WEST INTO CULVERT AT GRAPE CREEK UNDER NORFOLK SOUTHERN RAILROAD**



**DRAINAGE DITCH DOWNSTREAM OF COLTUS**





**UPSTREAM SIDE OF RAIL BRIDGE OVER GRAPE CREEK DOWNSTREAM  
OF KIK CUSTOM PRODUCTS**



**DOWNSTREAM SIDE OF RAIL BRIDGE AT GRAPE CREEK DOWNSTREAM  
OF KIK CUSTOM PRODUCTS**

**ATTACHMENT D**  
**Annual Facility Inspection Report**  
**MS4 PHASE 2 NPDES Permit No. IL400664**  
**Village of Tilton, Illinois**  
**(Reporting Period March 2015/2016)**

**PROPOSED 2016/2017 MS4 PHASE 2 NPDES STORM WATER ACTIVITY SUMMARY**

<b>BMP #</b>	<b>BMP</b>	<b>Category</b>	<b>Description</b>	<b>Proposed Activity</b>
A	Public education and outreach	A.1	Distributed paper material	Distribute public education material and make available at Village Hall and post on Village Storm Water Management website for interested public.
		A.5	Classroom education materials	Distribute public education and outreach material to interest public.
		A.6	Other Public Education	Conduct public meeting/training for Village Staff, contractors, trustees, school officials and public regarding Village MS4 Best Management Practices and Village Erosion Control and Storm Water Ordinances.
B	Public participation\involvement	B.2	Educational volunteer	The village to provide education materials to local schools to raise awareness on types of green infrastructure and how it benefits in reducing such pollution.
		B.7	Other public involvement	Distribution of EPA flyers and Village intends to post education material and flyers on website.
C	Illicit discharge detection and elimination	C.1	Sewer map preparation	Update digital storm and sanitary sewer facilities on map of Village facilities on Drainage Map including numbering of manholes and drainage outfall structures also washdown facilities. Print hard copy and post at Village Public Works facility.
		C.3	Detection/Elimination Prioritization Plan	Communicate to develop plan to inspect solid waste transportation equipment mobilizing through Village jurisdiction to identify sources of storm water pollution.
		C.7	Visual dry weather screening	Preform observation/screening of storm sewer outlets along Grape Creek and Vermilion River.
		C.8	Pollutant Field Testing	Collect samples of storm water discharge flowing toward Vermilion River then test for concentrations of Mercury, Polychlorinated biphenyls and Fecal Coliform. Test upstream and downstream of Tilton.
		C.10	Illicit Discharge Controls	Continue review of mapping for potential areas to detain and treat water run-off from major fires.
D	Construction site runoff control	D.2	Erosion and Sediment Control BMPs	Implement Village Erosion and Sediment Control Ordinances into construction projects.
		D.7	Other Construction Site Run-off Controls	Review and revise Village Erosion, Sediment Control and Storm Water Ordinance to reflect new permit requirements.
E	Post-Construction runoff control	E.4	Pre-Construction Review of BMP Design	Inspection of erosion and sediment control measures are being conducted by the Village officials and consulting engineers at pre and post-construction stages of the construction projects within the Village.
		E.6	Post-Construction Inspections	Village and consulting engineer to perform post-construction visual observation of construction sites regarding Storm Water Management BMPs.
		E.7	Other Post-Construction Run-off Controls	Conduct Annual Training for Village Staff & Contractors on low impact design techniques.



**ATTACHMENT D**  
**Annual Facility Inspection Report**  
**MS4 PHASE 2 NPDES Permit No. IL400664**  
**Village of Tilton, Illinois**  
**(Reporting Period March 2015/2016)**

**PROPOSED 2016/2017 MS4 PHASE 2 NPDES STORM WATER ACTIVITY SUMMARY- (CONTINUED)**

BMP #	BMP	Category	Description	Proposed Activity
F	Pollution Prevention/ Good Housekeeping	F.1	Employee Training Program	Continue training for Village public works personnel regarding proper street sweeping operations, sewer video inspection & location operations and debris disposal also snow and ice control operations.
		F.2	Inspection and Maintenance Program	Inspect inlet and outlet drainage facilities within Village thence remove debris and address erosion. Continue to sweep streets and document progress. Video inspect sewer piping.
		F.3	Municipal Operations Storm Water Control	Perform visual inspection of streams within Village jurisdiction for accumulated debris or erosion.
		F.4	Municipal Operation Waste Disposal	Improve operational plans to separate debris from stream, drainage system and various public works clean-ups into recyclables, landscape waste and garbage. Identify appropriate locations to dispose or recycle materials in manner avoiding storm water pollution.
		F.5	Flood Management/Access Guidelines	Inspect Grape Creek through Village to assess and remove debris build-up obstructing or potentially restricting channel and/or bridges. Address erosion erosion along creek allowing water to flow consistently and naturally through Village in manner minimizing flooding potential.
		F.6	Other Municipal Operation Controls	Inspect and measure drainage facilities immediately upstream of Village and plot on digital map.

**TENTATIVE LIST OF 2016/2017 CONSTRUCTION & MAINTENANCE PROJECTS**

Project	Item #	Item	Status
GRAPE CREEK IMPROVEMENTS	I	KEEGAN BR. DEBRIS REMOVAL AND EROSION MITIGATION	PROPOSED FOR 2017 SUMMER/FALL DRY SEASON IMPLEMENTATION (pending DECO extension)
MFT MAINTENANCE	II	SEAL COAT PAVEMENT VARIOUS STREETS	BID AND IMPLEMENT SUMMER 2016
EAST 1st STREET CHANNEL CLEARING	III	DEBRIS REMOVAL, GRADING & DRAINAGE MAINTENANCE	CURRENTLY BEING IMPROVED, FURTHER INSPECTIONS & ENGINEERING SUMMER & FALL 2016
EAST ROSS LANE SANITARY SEWER	IV	EXTEND SEWER SOUTH OF ROSS LANE	CONSTRUCTION PENDING
KING STREET DRAINAGE RELOCATION	V	DRAINAGE IMPROVEMENT	UNDER CONSIDERATION FOR IMPLEMENTATION
VOTEC TREATMENT PLANT DEACTIVATION SITE GRADING	VI	DEMOLITION & SITE GRADING	IMPLEMENTATION PENDING VERMILION COUNTY

**ATTACHMENT F**  
**Annual Facility Inspection Report**  
**MS4 PHASE 2 NPDES Permit No. IL400664**  
**Village of Tilton, Illinois**  
**(Reporting Period March 2015/2016)**

**LIST OF 2015/2016 CONSTRUCTION & MAINTENANCE PROJECTS**

<b>Project</b>	<b>Item #</b>	<b>Item</b>	<b>Status</b>
1st & 16th STREET SITE DEVELOPMENTS	I	GRADING, PAVING, DRAINAGE AND UTILITIY IMPROVEMENTS	SITE CONTINUES TO BE DEVELOPED
MFT MAINTENANCE	II	SEAL COAT PAVEMENT VARIOUS STREETS	BID AND IMPLEMENTED SUMMER 2015
SONGER CEMETERY SITE EXPANSION	III	SITE CLEARING AND GRADING	CURRENTLY BEING IMPROVED AND DEVELOPED; TURF IS RE-ESTABLISHED
PATTERSON STREET STORM SEWER	IV	STORM SEWER INSTALLATION	UNDER CONSTRUCTION BY VILLAGE STAFF
VOTEC TREATMENT PLANT DEACTIVATION SITE GRADING	V	DEMOLITION & SITE GRADING	TREATMENT PLANT DEACTIVATED, SITE DEMOLITION & GRADING PENDING VERMILION COUNTY





# A Citizen's Guide to Understanding Stormwater



EPA 833-B-03-002

January 2003

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or visit  
[www.epa.gov/nps/stormwater](http://www.epa.gov/nps/stormwater)  
[www.epa.gov/nps](http://www.epa.gov/nps)

For more information contact:



## After the Storm

### What is stormwater runoff?



Stormwater runoff occurs when precipitation from rain or snowmelt flows over the ground. Impervious surfaces like driveways, sidewalks, and streets prevent stormwater from naturally soaking into the ground.

### Why is stormwater runoff a problem?

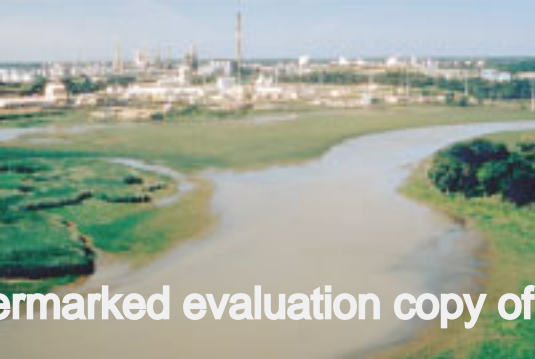


Stormwater can pick up debris, chemicals, dirt, and other pollutants and flow into a storm sewer system or directly to a lake, stream, river, wetland, or coastal water. Anything that enters a storm sewer system is discharged untreated into the waterbodies we use for swimming, fishing, and providing drinking water.

### The effects of pollution

Polluted stormwater runoff can have many adverse effects on plants, fish, animals, and people.

- ◆ Sediment can cloud the water and make it difficult or impossible for aquatic plants to grow. Sediment also can destroy aquatic habitats.
- ◆ Excess nutrients can cause algae blooms. When algae die, they sink to the bottom and decompose in a process that removes oxygen from the water. Fish and other aquatic organisms can't exist in water with low dissolved oxygen levels.
- ◆ Bacteria and other pathogens can wash into swimming areas and create health hazards, often making beach closures necessary.
- ◆ Debris—plastic bags, six-pack rings, bottles, and cigarette butts—washed into waterbodies can choke, suffocate, or disable aquatic life like ducks, fish, turtles, and birds.
- ◆ Household hazardous wastes like insecticides, pesticides, paint, solvents, used motor oil, and other auto fluids can poison aquatic life. Land animals and people can become sick or die from eating diseased fish and shellfish or ingesting polluted water.
- ◆ Polluted stormwater often affects drinking water sources. This, in turn, can affect human health and increase drinking water treatment costs.





# Stormwater Pollution Solutions

## Residential

*Recycle or properly dispose of household products that contain chemicals, such as insecticides, pesticides, paint, solvents, and used motor oil and other auto fluids. Don't pour them onto the ground or into storm drains.*

### Lawn care

Excess fertilizers and pesticides applied to lawns and gardens wash off and pollute streams. In addition, yard clippings and leaves can wash into storm drains and contribute nutrients and organic matter to streams.

- ◆ Don't overwater your lawn. Consider using a soaker hose instead of a sprinkler.
- ◆ Use pesticides and fertilizers sparingly. When use is necessary, use these chemicals in the recommended amounts. Use organic mulch or safer pest control methods whenever possible.
- ◆ Compost or mulch yard waste. Don't leave it in the street or sweep it into storm drains or streams.
- ◆ Cover piles of dirt or mulch being used in landscaping projects.



### Septic systems

Leaking and poorly maintained septic systems release nutrients and pathogens (bacteria and viruses) that can be picked up by stormwater and discharged into nearby waterbodies. Pathogens can cause public health problems and environmental concerns.

- ◆ Inspect your system every 3 years and pump your tank as necessary (every 3 to 5 years).
- ◆ Don't dispose of household hazardous waste in sinks or toilets.



### Auto care

Washing your car and degreasing auto parts at home can send detergents and other contaminants through the storm sewer system. Dumping automotive fluids into storm drains has the same result as dumping the materials directly into a waterbody.

- ◆ Use a commercial car wash that treats or recycles its wastewater, or wash your car on your yard so the water infiltrates into the ground.
- ◆ Repair leaks and dispose of used auto fluids and batteries at designated drop-off or recycling locations.



*Education is essential to changing people's behavior. Signs and markers near storm drains warn residents that pollutants entering the drains will be carried untreated into a local waterbody.*

## Residential landscaping

**Permeable Pavement**—Traditional concrete and asphalt don't allow water to soak into the ground. Instead these surfaces rely on storm drains to divert unwanted water. Permeable pavement systems allow rain and snowmelt to soak through, decreasing stormwater runoff.

**Rain Barrels**—You can collect rainwater from rooftops in mosquito-proof containers. The water can be used later on lawn or garden areas.

**Rain Gardens and Grassy Swales**—Specially designed areas planted with native plants can provide natural places for rainwater to collect and soak into the ground. Rain from rooftop areas or paved areas can be diverted into these areas rather than into storm drains.

**Vegetated Filter Strips**—Filter strips are areas of native grass or plants created along roadways or streams. They trap the pollutants stormwater picks up as it flows across driveways and streets.



## Commercial

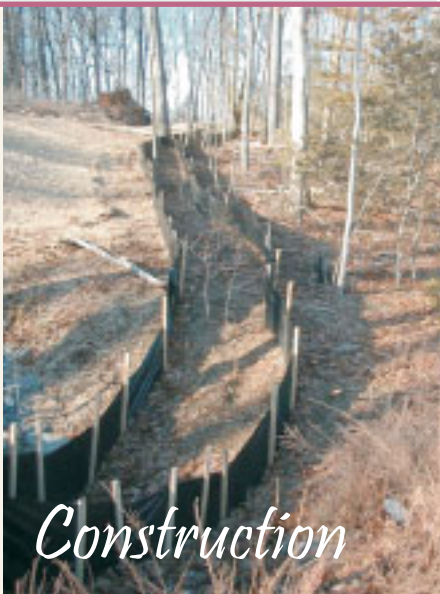
Dirt, oil, and debris that collect in parking lots and paved areas can be washed into the storm sewer system and eventually enter local waterbodies.

- ◆ Sweep up litter and debris from sidewalks, driveways and parking lots, especially around storm drains.
- ◆ Cover grease storage and dumpsters and keep them clean to avoid leaks.
- ◆ Report any chemical spill to the local hazardous waste cleanup team. They'll know the best way to keep spills from harming the environment.

Erosion controls that aren't maintained can cause excessive amounts of sediment and debris to be carried into the stormwater system. Construction vehicles can leak fuel, oil, and other harmful fluids that can be picked up by stormwater and deposited into local waterbodies.

- ◆ Divert stormwater away from disturbed or exposed areas of the construction site.
- ◆ Install silt fences, vehicle mud removal areas, vegetative cover, and other sediment and erosion controls and properly maintain them, especially after rainstorms.
- ◆ Prevent soil erosion by minimizing disturbed areas during construction projects, and seed and mulch bare areas as soon as possible.

## Construction



## Agriculture

Lack of vegetation on streambanks can lead to erosion. Overgrazed pastures can also contribute excessive amounts of sediment to local waterbodies. Excess fertilizers and pesticides can poison aquatic animals and lead to destructive algae blooms. Livestock in streams can contaminate waterways with bacteria, making them unsafe for human contact.

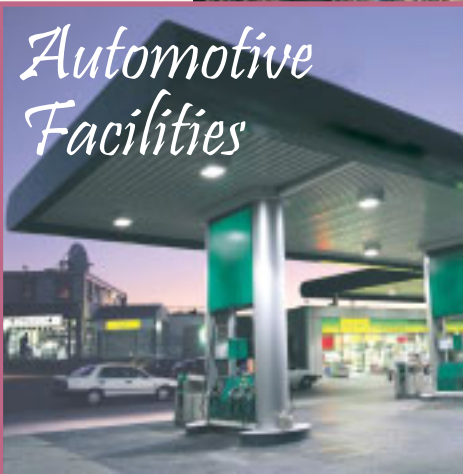
- ◆ Keep livestock away from streambanks and provide them a water source away from waterbodies.
- ◆ Store and apply manure away from waterbodies and in accordance with a nutrient management plan.
- ◆ Vegetate riparian areas along waterways.
- ◆ Rotate animal grazing to prevent soil erosion in fields.
- ◆ Apply fertilizers and pesticides according to label instructions to save money and minimize pollution.



## Forestry

- Improperly managed logging operations can result in erosion and sedimentation.
- ◆ Conduct preharvest planning to prevent erosion and lower costs.
  - ◆ Use logging methods and equipment that minimize soil disturbance.
  - ◆ Plan and design skid trails, yard areas, and truck access roads to minimize stream crossings and avoid disturbing the forest floor.
  - ◆ Construct stream crossings so that they minimize erosion and physical changes to streams.
  - ◆ Expedite revegetation of cleared areas.

## Automotive Facilities



Uncovered fueling stations allow spills to be washed into storm drains. Cars waiting to be repaired can leak fuel, oil, and other harmful fluids that can be picked up by stormwater.

- ◆ Clean up spills immediately and properly dispose of cleanup materials.
- ◆ Provide cover over fueling stations and design or retrofit facilities for spill containment.
- ◆ Properly maintain fleet vehicles to prevent oil, gas, and other discharges from being washed into local waterbodies.
- ◆ Install and maintain oil/water separators.



# Clean Water



Everybody's  
Business



## 10 Things You Can Do to Prevent Stormwater Runoff Pollution

- 💧 Use fertilizers sparingly and sweep up driveways, sidewalks, and gutters
- 💧 Never dump anything down storm drains or in streams
- 💧 Vegetate bare spots in your yard
- 💧 Compost your yard waste
- 💧 Use least toxic pesticides, follow labels, and learn how to prevent pest problems
- 💧 Direct downspouts away from paved surfaces; consider starting a rain garden
- 💧 Take your car to the car wash instead of washing it in the driveway
- 💧 Check your car for leaks and recycle your motor oil
- 💧 Pick up after your pet
- 💧 Have your septic tank pumped and system inspected regularly



**EPA**

United States  
Environmental Protection  
Agency

For more information, visit  
[www.epa.gov/nps](http://www.epa.gov/nps) or

[www.epa.gov/nps/stormwater](http://www.epa.gov/nps/stormwater)



# Stormwater and the Construction Industry

## Protect Natural Features



**Bad**



**Good**

- Minimize clearing.
- Minimize the amount of exposed soil.
- Identify and protect areas where existing vegetation, such as trees, will not be disturbed by construction activity.
- Protect streams, stream buffers, wild woodlands, wetlands, or other sensitive areas from any disturbance or construction activity by fencing or otherwise clearly marking these areas.

## Construction Phasing



**Bad**



**Good**

- Sequence construction activities so that the soil is not exposed for long periods of time.
- Schedule or limit grading to small areas.
- Install key sediment control practices before site grading begins.
- Schedule site stabilization activities, such as landscaping, to be completed immediately after the land has been graded to its final contour.

## Vegetative Buffers



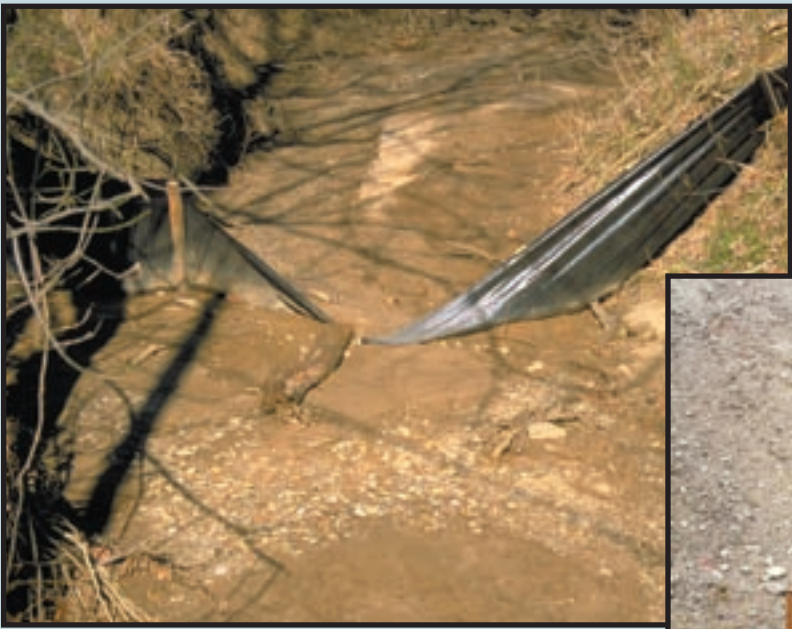
**Bad**



**Good**

- Protect and install vegetative buffers along waterbodies to slow and filter stormwater runoff.
- Maintain buffers by mowing or replanting periodically to ensure their effectiveness.

## Silt Fencing



**Bad**



**Good**

- Inspect and maintain silt fences after each rainstorm.
- Make sure the bottom of the silt fence is buried in the ground.
- Securely attach the material to the stakes.
- Don't place silt fences in the middle of a waterway or use them as a check dam.
- Make sure stormwater is not flowing around the silt fence.

# Maintain your BMPs!

[www.epa.gov/npdes/menuofbmps](http://www.epa.gov/npdes/menuofbmps)

## Site Stabilization



**Bad**



**Good**

- Vegetate, mulch, or otherwise stabilize all exposed areas as soon as land alterations have been completed.

## Construction Entrances



**Bad**



**Good**

- Remove mud and dirt from the tires of construction vehicles before they enter a paved roadway.
- Properly size entrance BMPs for all anticipated vehicles.
- Make sure that the construction entrance does not become buried in soil.

## Slopes



**Bad**



**Good**

- Rough grade or terrace slopes.
- Break up long slopes with sediment barriers, or under drain, or divert stormwater away from slopes.

## Dirt Stockpiles



**Bad**



**Good**

- Cover or seed all dirt stockpiles.

## Storm Drain Inlet Protection



**Bad**



**Good**

- Use rock or other appropriate material to cover the storm drain inlet to filter out trash and debris.
- Make sure the rock size is appropriate (usually 1 to 2 inches in diameter).
- If you use inlet filters, maintain them regularly.



# Stormwater and the Construction Industry

## Planning and Implementing Erosion and Sediment Control Practices

The construction industry is a critical participant in the nation's efforts to protect streams, rivers, lakes, wetlands, and oceans. Through the use of best management practices (BMPs), construction site operators are the key defense against erosion and sedimentation.

As stormwater flows over a construction site, it picks up pollutants like sediment, debris, and chemicals. High volumes of stormwater can also cause stream bank erosion, and destroy downstream aquatic habitat. Preventing soil erosion and sedimentation is an important responsibility at all construction sites.

In addition to the environmental impact, uncontrolled erosion can have a significant financial impact on a construction project. It costs money and time to repair gullies, replace vegetation, clean sediment-clogged storm drains, replace poorly installed BMPs, and mitigate damage to other people's property or to natural resources.

### Best Management Practice (BMP)

A BMP is a method used to prevent or control stormwater runoff and the discharge of pollutants, including sediment, into local waterbodies. Silt fences, inlet protection, and site-stabilization techniques are typical BMPs on a construction site.

### Operator

An operator is someone who has control over and the ability to modify construction plans and specifications (e.g. owner, general contractor)

or

Someone who has control over the day-to-day operations at a site (e.g., owner, general contractor) that are necessary to ensure compliance with the permit requirements. It is the responsibility of a construction site owner or operator to contain stormwater runoff and prevent erosion during all stages of a project.

There may be more than one person at a site who meets these definitions and must apply for permit coverage. (States may have different definitions of the term "operator.")

### So what's being done about polluted runoff?

The Clean Water Act includes the National Pollutant Discharge Elimination System (NPDES) permitting program. As of January 2003, 44 states and territories are authorized to issue NPDES stormwater permits. If your state isn't authorized to operate the NPDES stormwater permit program, EPA issues the permits. Permits vary from state to state, so contact your state or EPA for specific information. Your permitting authority has specific information on your state's NPDES stormwater permit program. In general, construction permits require construction operators to do all of the following:

- Develop and implement a stormwater pollution prevention plan
- Submit a permit application or notice of intent (NOI)
- Comply with the permit, including maintaining BMPs and inspecting the site

Under the NPDES program, construction activities that disturb 1 or more acres are required to obtain stormwater permit coverage. States have different names for the plans that construction operators must develop, such as

- Stormwater pollution prevention plan
- Erosion and sediment control plan
- Erosion control and stormwater management plan
- Stormwater management plan
- Water pollution control plan
- Pollution prevention plan

This document uses the term "*Plan*."

### I think I need a permit... Where do I start?

All land-disturbing activities, including clearing, grading, and excavation, that disturb **1 or more acres** are required to be covered under a state or EPA-issued NPDES construction stormwater permit **prior to land disturbance**. Permit requirements vary by state. Begin by researching the specific requirements in your state. You might already be subject to local erosion and sediment control requirements, but that doesn't release you from the requirements of the NPDES program at the state or EPA level. Although you must comply with both sets of requirements, in most cases they have been designed to be complementary. Contact your permitting authority to find out exactly what you need to do. A good place to start your search is the Construction Industry Compliance Assistance web site at <http://www.envcap.org/cica>.

The NPDES permit requirements include small construction activities that are part of a larger common plan of development or sale, such as a single lot within a larger subdivision. For developments with multiple operators, all operators must have permit coverage for their individual parts of the larger development, no matter how large or small each operation happens to be. When there are multiple operators at one site, they're encouraged to develop and share one comprehensive Plan and obtain permit coverage as co-permittees.

The **owner or operator** of the construction site is responsible for complying with the requirements of the permit. Responsibilities include developing a Plan, obtaining permit coverage, implementing BMPs, and stabilizing the site at the end of the construction activity.

### Determine your eligibility

All construction activity that disturbs 1 or more acres of land, as well as activity that disturbs less than 1 acre but is part of a larger common plan of development, must obtain permit coverage.

### Read and understand your stormwater permit requirements

Get a copy of the permit for construction activities and a permit application (or notice of intent form) from your state or EPA permitting authority.

### Develop a Plan

Most states do not require you to submit your Plan. However, you do need to keep the Plan on site. If that's impractical, you may post a notice that tells where the Plan is kept so it can be accessed by the permitting authority and other interested parties.

You'll need to post a copy of your completed application on site. Put it in a place where the public can see it so they'll know your site is covered by an NPDES permit!

### Apply for permit coverage

Once you understand your permit requirements and have developed a Plan, you can submit a stormwater permit application (or notice of intent) to your permitting authority. This must be done before beginning any land disturbance on the site. Some states require a few days of lead time, so check with your permitting authority. Once you've submitted the application, you must satisfy the conditions of the permit.

### Implement the Plan

Be prepared to implement the BMPs in your Plan before construction begins. Ensure that BMPs are properly maintained, and upgrade and repair them as necessary.

## Developing and Implementing a Plan

You must have a Plan that includes erosion and sediment control and pollution prevention BMPs. These Plans require

- Advance planning and training to ensure proper implementation of the BMPs
- Erosion and sediment control BMPs in place until the area is permanently stabilized
- Pollution prevention BMPs to keep the construction site "clean"
- Regular inspection of the construction site to ensure proper installation and maintenance of BMPs

Fortunately, the practices and measures that must be included in your Plan are already part of the standard operating procedures at many construction sites.

Six steps are associated with developing and implementing a stormwater Plan. There's a wealth of information available on developing pollution prevention plans. Please contact your permitting authority for help in finding additional guidance materials, or visit [www.epa.gov/npdes/stormwater](http://www.epa.gov/npdes/stormwater). A sample construction plan is available at [www.epa.gov/npdes/pubs/sample\\_swppp.pdf](http://www.epa.gov/npdes/pubs/sample_swppp.pdf).

### 1. Site Evaluation and Design Development

- Collect site information
- Develop site plan design
- Prepare pollution prevention site map

The first step in preparing a Plan is to define the characteristics of the site and the type of construction that will occur. This involves collecting site information, identifying natural features that should be protected, developing a site plan design, describing the nature of the construction activity, and preparing a pollution prevention site map.

### 2. Assessment

- Measure the site area
- Determine the drainage areas
- Calculate the runoff coefficient

The next step is assessing the impact the project will have on stormwater runoff. Determine the drainage areas and estimate the runoff amounts and velocities. For more information on calculating the runoff coefficient, go to [www.epa.gov/npdes/pubs/chap02\\_conguide.pdf](http://www.epa.gov/npdes/pubs/chap02_conguide.pdf), page 11.

### 3. Control Selection and Plan Design

- Review and incorporate state or local requirements
- Select erosion and sediment controls
- Select other controls
- Select stormwater management controls
- Indicate the location of controls on the site map
- Prepare an inspection and maintenance plan
- Coordinate controls with construction activity
- Prepare sequence of major activities

In the third step you'll actually document your procedures to prevent and control polluted stormwater runoff. You must delineate areas that will not be disturbed, including critical natural areas like streamside areas, floodplains, and trees. You must also identify the measures (or BMPs) you'll use to protect these areas.

#### Soil erosion control tips...

- Design the site to infiltrate stormwater into the ground and to keep it out of storm drains. Eliminate or minimize the use of stormwater collection and conveyance systems while maximizing the use of stormwater infiltration and bioretention techniques.
- Minimize the amount of exposed soil on site.
  - ◆ To the extent possible, plan the project in stages to minimize the amount of area that is bare and subject to erosion. The less soil exposed, the easier and cheaper it will be to control erosion.
  - ◆ Vegetate disturbed areas with permanent or temporary seeding immediately upon reaching final grade.
  - ◆ Vegetate or cover stockpiles that will not be used immediately.
- Reduce the velocity of stormwater both onto and away from the project area.
  - ◆ Interceptors, diversions, vegetated buffers, and check dams are a few of the BMPs that can be used to slow down stormwater as it travels across and away from the project site.
  - ◆ Diversion measures can also be used to direct flow away from exposed areas toward stable portions of the site.
  - ◆ Silt fences and other types of perimeter filters should never be used to reduce the velocity of runoff.
- Protect defined channels immediately with measures adequate to handle the storm flows expected.
  - ◆ Sod, geotextile, natural fiber, riprap, or other stabilization measures should be used to allow the channels to carry water without causing erosion. Use softer measures like geotextile or vegetation where possible to prevent downstream impacts.
- Keep sediment on site.
  - ◆ Place aggregate or stone at construction site vehicle exits to accommodate at least two tire revolutions of large construction vehicles. Much of the dirt on the tires will fall off before the vehicle gets to the street.
  - ◆ Regular street sweeping at the construction entrance will prevent dirt from entering storm drains. Do not hose paved areas.
  - ◆ Sediment traps and basins are temporary structures and should be used in conjunction with other measures to reduce the amount of erosion.
- Maintaining all BMPs is critical to ensure their effectiveness during the life of the project.
  - ◆ Regularly remove collected sediment from silt fences, berms, traps, and other BMPs.
  - ◆ Ensure that geotextiles and mulch remain in place until vegetation is well established.
  - ◆ Maintain fences that protect sensitive areas, silt fences, diversion structures, and other BMPs.

#### Other BMPs and Activities to Control Polluted Runoff

You'll need to select other controls to address potential pollutant sources on your site. Construction materials, debris, trash, fuel, paint, and stockpiles become pollution sources when it rains. Basic pollution prevention practices can significantly reduce the amount of pollution leaving construction sites. The following are some simple practices that should be included in the Plan and implemented on site:

- Keep potential sources of pollution out of the rain as practicable (e.g., inside a building, covered with plastic or tarps, or sealed tightly in a leak-proof container).
- Clearly identify a protected, lined area for concrete truck washouts. This area should be located away from streams, storm drain inlets, or ditches and should be cleaned out periodically.
- Park, refuel, and maintain vehicles and equipment in one area of the site to minimize the area exposed to possible spills and fuel storage. This area should be well away from streams, storm drain inlets, or ditches. Keep spill kits close by and clean up any spills or leaks immediately, including spills on pavement or earthen surfaces.
- Practice good housekeeping. Keep the construction site free of litter, construction debris, and leaking containers. Keep all waste in one area to minimize cleaning.
- Never hose down paved surfaces to clean dust, debris, or trash. This water could wash directly into storm drains or streams. Sweep up materials and dispose of them in the trash. Never bury trash or debris!
- Dispose of hazardous materials properly.

### 4. Certification and Notification

- Certify the Plan
- Submit permit application or notice of intent

Once the Plan has been developed, an authorized representative must sign it. Now is the time to submit the permit application or notice of intent. Your permit might require that the Plan be kept on site, so be sure to keep it available for the staff implementing the Plan.

*Erosion and sedimentation control practices are only as good as their installation and maintenance.*

### 5. Implementing and Maintaining a Plan

- Implement controls
- Inspect and maintain controls
- Update/change the Plan
- Report releases of hazardous materials

A Plan describes the practices and activities you'll use to prevent stormwater contamination and meet the NPDES permit requirements. Make sure that the Plan is implemented and that the Plan is updated as necessary to reflect changes on the site.

Erosion and sedimentation control practices are only as good as their installation and maintenance. Train the contractors that will install the BMPs and inspect immediately to ensure that the BMPs have been installed correctly.

Regularly inspect the BMPs (especially before and after rain events) and perform any necessary repairs or maintenance immediately. Many BMPs are designed to handle a limited amount of sediment. If not maintained, they'll become ineffective and a source of sediment pollution.

It's also important to keep records of BMP installation, implementation, and maintenance. Keep track of major grading activities that occur on the site, when construction activities cease (temporarily or permanently), and when a site is temporarily or permanently stabilized.

If construction plans change at any time, or if more appropriate BMPs are chosen for the site, update the Plan accordingly.

### 6. Completing the Project: Final Stabilization and Termination of the Permit

- Final stabilization
- Notice of Termination
- Record retention

Many states and EPA require a Notice of Termination (NOT) or other notification signifying that the construction activity is completed. An NOT is required when

- Final stabilization has been achieved on all portions of the site for which the permittee is responsible.

- Another operator has assumed control over all areas of the site that have not been finally stabilized. That operator would need to submit a new permit application to the permitting authority.

- For residential construction only, temporary stabilization of a lot has been completed prior to transference of ownership to the homeowner, with the homeowner being made aware of the need to perform final stabilization.

Permittees must keep a copy of their permit application and their Plan for at least 3 years following final stabilization. This period may be longer depending on state and local requirements.

#### Preconstruction Checklist

- A site description, including
  - ◆ Nature of the activity
  - ◆ Intended sequence of major construction activities
  - ◆ Total area of the site
  - ◆ Existing soil type and rainfall runoff data
- A site map with:
  - Drainage patterns
  - Approximate slopes after major grading
  - Area of soil disturbance
  - Outline of areas which will not be disturbed
  - Location of major structural and nonstructural soil erosion controls
  - Areas where stabilization practices are expected to occur
  - Surface waters
  - Stormwater discharge locations
- ◆ Name of the receiving water(s)
- A description of controls:
  - ◆ Erosion and sediment controls, including
    - Stabilization practices for all areas disturbed by construction
    - Structural practices for all drainage/discharge locations
  - ◆ Stormwater management controls, including
    - Measures used to control pollutants occurring in stormwater discharges after construction activities are complete
    - Velocity dissipation devices to provide nonerosive flow conditions from the discharge point along the length of any outfall channel
  - ◆ Other controls, including
    - Waste disposal practices that prevent discharge of solid materials
    - Measures to minimize offset tracking of sediments by construction vehicles
    - Measures to ensure compliance with state or local waste disposal, sanitary sewer, or septic system regulations
  - ◆ Description of the timing during the construction when measures will be implemented
- State or local requirements incorporated into the Plan
- Inspection and maintenance procedures for control measures identified in the Plan
- Contractor certification and Plan certification

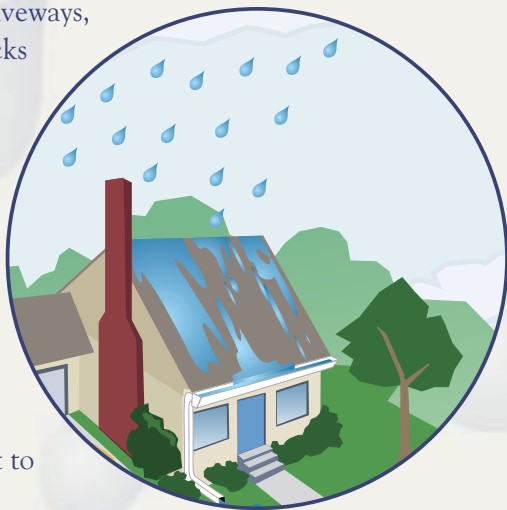
#### Implementation Checklist

- Maintain records of construction activities, including
  - ◆ Dates when major grading activities occur
  - ◆ Dates when construction activities temporarily cease on the site or a portion of the site
  - ◆ Dates when construction activities permanently cease on the site or a portion of the site
  - ◆ Dates when stabilization measures are completed on the site
- Prepare inspection reports summarizing
  - ◆ Name of person conducting BMP inspections
  - ◆ Qualifications of person conducting BMP inspections
  - ◆ BMPs/areas inspected
  - ◆ Observed conditions
  - ◆ Necessary changes to the Plan
- Report releases of reportable quantities of oil or hazardous materials
  - ◆ Notify the National Response Center at 800-424-8802 immediately
  - ◆ Report releases to your permitting authority immediately, or as specified in your permit. You must also provide a written report within 14 days.
- Modify the Plan to include
  - The date of release
  - Circumstances leading to the release
  - Steps taken to prevent reoccurrence of the release
- Modify Plan as necessary
  - ◆ Incorporate requests of the permitting authority to bring the Plan into compliance
  - ◆ Address changes in design, construction operation, or maintenance that affect the potential for discharge of pollutants

*An ounce of prevention is worth a pound of cure! It's far more efficient and cost-effective to prevent pollution than it is to try to correct problems later. Installing and maintaining simple BMPs and pollution prevention techniques on site can greatly reduce the potential for stormwater pollution and can also save you money!*




As stormwater flows over driveways, lawns, and sidewalks, it picks up debris, chemicals, dirt, and other pollutants. Stormwater can flow into a storm sewer system or directly to a lake, stream, river, wetland, or coastal water. Anything that enters a storm sewer system is discharged untreated into the waterbodies we use for swimming, fishing, and providing drinking water. Polluted runoff is the nation's greatest threat to clean water.



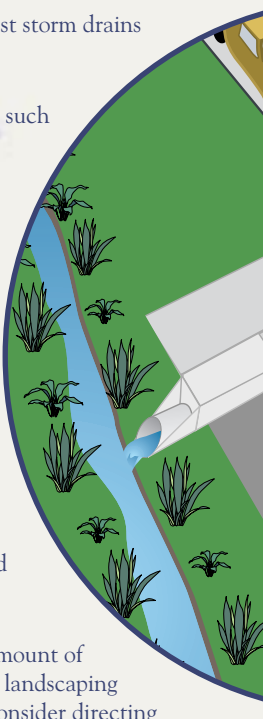
By practicing healthy household habits, homeowners can keep common pollutants like pesticides, pet waste, grass clippings, and automotive fluids off the ground and out of stormwater. Adopt these healthy household habits and help protect lakes, streams, rivers, wetlands, and coastal waters. Remember to share the habits with your neighbors!

## Healthy Household Habits for Clean Water

### Vehicle and Garage

- Use a commercial car wash or wash your car on a lawn or other unpaved surface to **minimize** the amount of dirty, soapy water flowing into the storm drain and eventually into your local waterbody.
  - Check your car, boat, motorcycle, and other machinery and equipment for leaks and spills. Make repairs as soon as possible. Clean up **spilled fluids** with an absorbent material like kitty litter or sand, and don't rinse the spills into a nearby storm drain. Remember to properly dispose of the absorbent material.
  - **Recycle** used oil and other automotive fluids at participating service stations. Don't dump these chemicals down the storm drain or dispose of them in your trash.
- 
- ### Lawn and Garden
- Use pesticides and fertilizers **sparingly**. When use is necessary, use these chemicals in the recommended amounts. Avoid application if the forecast calls for rain; otherwise, chemicals will be washed into your local stream.
  - Select **native** plants and grasses that are drought- and pest-resistant. Native plants require less water, fertilizer, and pesticides.
  - **Sweep up** yard debris, rather than hosing down areas. Compost or recycle yard waste when possible.
  - Don't overwater your lawn. Water during the **cool** times of the day, and don't let water run off into the storm drain.
  - Cover piles of dirt and mulch being used in landscaping projects to prevent these pollutants from blowing or washing off your yard and into local waterbodies. **Vegetate** bare spots in your yard to prevent soil erosion.

### Home Repair and Improvement

- Before beginning an outdoor project, locate the nearest storm drains and **protect** them from debris and other materials.
  - **Sweep up** and properly dispose of construction debris such as concrete and mortar.
  - Use hazardous substances like paints, solvents, and cleaners in the **smallest amounts possible**, and follow the directions on the label. Clean up spills **immediately**, and dispose of the waste safely. Store substances properly to avoid leaks and spills.
  - Purchase and use **nontoxic, biodegradable, recycled, and recyclable** products whenever possible.
  - **Clean** paint brushes in a sink, not outdoors. Filter and reuse paint thinner when using oil-based paints. Properly dispose of excess paints through a household hazardous waste collection program, or donate unused paint to local organizations.
  - **Reduce** the amount of paved area and increase the amount of vegetated area in your yard. Use native plants in your landscaping to reduce the need for watering during dry periods. Consider directing downspouts away from paved surfaces onto lawns and other measures to increase infiltration and reduce polluted runoff.
- 



# Make your home The SOLUTION TO STORMWATER POLLUTION!

A homeowner's guide to healthy  
habits for clean water



**Remember: Only rain down the drain!**

For more information, visit  
[www.epa.gov/npdes/stormwater](http://www.epa.gov/npdes/stormwater)  
or  
[www.epa.gov/nps](http://www.epa.gov/nps)

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## Storm drains connect to waterbodies!

- Flush responsibly. Flushing household chemicals like paint, pesticides, oil, and antifreeze can destroy the biological treatment taking place in the system. Other items, such as diapers, paper towels, and cat litter, can clog the septic system and potentially damage components.
- Care for the septic system drainfield by **not** driving or parking vehicles on it. Plant only grass over and near the drainfield to avoid damage from roots.
- Have your septic system **inspected** by a professional at least every 3 years, and have the septic tank **pumped** as necessary (usually every 3 to 5 years).
- Properly store pool and spa chemicals to **prevent** leaks and spills, preferably in a covered area to avoid exposure to stormwater.
- Whenever possible, drain your pool or spa into the **sanitary** sewer system.
- **Drain** your swimming pool only when a test kit does not detect chlorine levels.

## Swimming Pool and Spa

- When walking your pet, remember to **pick up** the waste and dispose of it properly. Flushing pet waste is the best disposal method. Leaving pet waste on the ground increases public health risks by allowing harmful bacteria and nutrients to wash into the storm drain and eventually into local waterbodies.

## Pet Care



# Water-Efficient Landscaping:



Preventing  
Pollution &  
Using Resources  
Wisely

# A Message from the Administrator



Christine Todd Whitman

I believe water is the biggest environmental issue we face in the 21st Century in terms of both quality and quantity. In the 30 years since its passage, the Clean Water Act has dramatically increased the number of waterways that are once again safe for fishing and swimming. Despite this great progress in reducing water pollution, many of the nation's waters still do not meet water quality goals. I challenge you to join with me to finish the business of restoring and protecting our nation's waters for present and future generations.

United States Environmental Protection Agency  
Office of Water (4204M)  
EPA832-F-02-002  
September 2002  
[www.epa.gov/owm/water-efficiency/index.htm](http://www.epa.gov/owm/water-efficiency/index.htm)





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# What is Water-efficient Landscaping?

Water, many agree, is our most precious natural resource; without it, life ceases. Yet judging by our water use and consumption practices, many of us in the United States seem to take it for granted. A typical household uses approximately 260 gallons of water per day. "Water conscious" individuals often install high-efficiency shower heads and toilets and wash only full loads of clothes and dishes to reduce consumption. But in the summer, the amount of water used outdoors by a household can exceed the amount used for all other purposes in the entire year. This is especially true in hot, dry climates.

Gardening and lawn care account for the majority of this seasonal increase, but other outdoor activities, such as washing cars and filling swimming pools, also contribute. According to the U.S. Geological Survey, of the 26 billion gallons of water consumed daily in the United States<sup>1</sup>, approximately 7.8 billion gallons, or 30 percent<sup>2</sup>, is devoted to outdoor uses. The majority of this is used for landscaping. In fact, it is estimated that the typical suburban lawn consumes 10,000 gallons of water above and beyond rainwater each year (Vickers, p 140).

Many mistakenly believe that stunning gardens and beautiful lawns are only possible through extensive watering, fertilization, and pesticide application. As this booklet will demonstrate, eye-catching gardens and landscapes that save water, prevent pollution, and

protect the environment are, in fact, easily achieved by employing water-efficient landscaping. Water-efficient landscaping produces attractive landscapes because it utilizes designs and plants suited to local conditions.

This booklet describes the benefits of water-efficient landscaping. It includes several examples of successful projects and programs, as well as contacts, references, and a short bibliography. For specific information about how to best apply water-efficient landscaping principles to your geographical area, consult with your county



*Xeriscape garden at Denver Water*

extension service and local garden and nursery centers. Local governments and water utilities also possess a wealth of information and suggestions for using water more efficiently in all aspects of your life, including landscaping.

<sup>1</sup> W.B. Solley, R.R. Pierce, and H.A. Perlman. 1998. *Estimated Use of Water in the United States in 1995* (USGS Circular 1200). USGS. Reston, VA. p.27.

<sup>2</sup> Amy Vickers. 2001. *Handbook of Water Use and Conservation*. WaterPlow Press. Amherst, MA. p. 140.



*Xeriscaped front yard in Colorado Springs*

Many terms and schools of thought have been used to describe approaches to water-efficient landscaping. Some examples include “water-wise,” “water-smart,” “low-water,” and “natural landscaping.” While each of these terms varies in philosophy and approach, they are all based on the same principles and are commonly used interchangeably. One of the first conceptual approaches developed to formalize these principles is known as “Xeriscape<sup>3</sup> landscaping.” Xeriscape landscaping is defined as “quality landscaping that conserves water and protects the environment.” The word “Xeriscape” was coined and copyrighted by

Denver Water Department in 1981 to help make water conserving landscaping an easily recognized concept. The word is a combination of the Greek word “xeros,” which means “dry,” and “landscape.”

The seven principles upon which Xeriscape landscaping is based are:

- Proper planning and design
- Soil analysis and improvement
- Appropriate plant selection
- Practical turf areas
- Efficient irrigation
- Use of mulches
- Appropriate maintenance

The eight fundamentals of water-wise landscaping, below, illustrate the similarities in the underlying concepts and principles of Xeriscape landscaping and other water-efficient approaches.

- Group plants according to their water needs.
- Use native and low-water-use plants.
- Limit turf areas to those needed for practical uses.
- Use efficient irrigation systems.
- Schedule irrigation wisely.
- Make sure soil is healthy.
- Remember to mulch.
- Provide regular maintenance.

In short, plan and maintain your landscape with these principles of water efficiency in mind and it will continue to conserve water and be attractive.

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<sup>3</sup> Denver Water welcomes the use of the term Xeriscape in books, articles, and speeches promoting water conserving landscape. EPA is using this term with permission from Denver Water. For permission to use “Xeriscape” in your publications, call Denver Water at 303 628-6330.



# Why Use Water-efficient Landscaping?

Proper landscaping techniques not only create beautiful landscapes, but also benefit the environment and save water. In addition, attractive, water-efficient, low-maintenance landscapes can increase home values.

Water-efficient landscaping offers many economic and environmental benefits, including:

- Lower water bills from reduced water use.
- Conservation of natural resources and preservation of habitat for plants and wildlife such as fish and waterfowl.
- Decreased energy use (and air pollution associated with its generation) because less pumping and treatment of water is required.
- Reduced home or office heating and cooling costs through the careful placement of trees and plants.
- Reduced runoff of stormwater and irrigation water that carries top soils, fertilizers, and pesticides into lakes, rivers, and streams.
- Fewer yard trimmings to be managed or landfilled.
- Reduced landscaping labor and maintenance costs.
- Extended life for water resources infrastructure (e.g., reservoirs, treatment plants, groundwater aquifers), thus reduced taxpayer costs.



Meadow Sage (*Salvia pratensis*) is the background for New Mexico Evening Primrose (*Oenothera berlandieri* 'siskiyou')

# How is Water-efficient Landscaping Applied?

Landscaping that conserves water and protects the environment is not limited to arid landscapes with only rocks and cacti.



*Dragon's Blood Sedum*  
(*Sedum spurium*) under  
*Honeylocust Trees* (*Gleditsia*  
*triacanthos*)

Through careful planning, landscapes can be designed to be both pleasing to the senses and kind to the environment. One simple approach to achieving this is applying and adopting the basic principles of water-efficient landscaping to suit your climatic region. The seven principles of Xeriscape landscaping are used below to describe these basic concepts in greater detail.

## Proper planning and design

Developing a landscape plan is the first and most important step in creating a water-efficient landscape. Your plan

water-efficient landscapes and allow you to continually improve your landscape over time.

## Soil analysis and improvements

Because soils vary from site to site, test your soil before beginning your landscape improvements. Your county extension service can analyze the pH levels; nutrient levels (e.g., nitrogen, phosphorus, potassium); and the sand, silt, clay, and organic matter content of your soil. It can also suggest ways to improve your soil's ability to support plants and retain water (e.g., through aeration or the addition of soil amendments or fertilizers).

## Appropriate plant selection

Your landscape design should take into account your local climate as well as soil conditions. Focus on preserving as many existing trees and shrubs as possible because established plants usually require less water and maintenance. Choose plants native to your region. Native plants, once established, require very little to no additional water beyond normal rainfall. Also, because they are adapted to local soils and climatic conditions, native plants commonly do not require the addition of fertilizers and are more resistant to pests and disease.

When selecting plants, avoid those labeled "hard to establish," "susceptible to disease," or "needs frequent attention," as these types of plants frequently require large amounts of supplemental water, fertilizers, and pesticides. Be careful when selecting non-indigenous species as some of them may become invasive. An invasive plant might be a water guzzler and will surely choke out native species. Your state or county extension service or local nursery can help you select appropriate plants for your area.



The key to successful planting and transplanting is getting the roots to grow into the surrounding soil as quickly as possible. Knowing when and where to plant is crucial to speeding the establishment of new plants. The best time to plant will vary from species to species. Some plants will thrive when planted in a dormant or inactive state. Others succeed when planted during the season when root generation is highest and sufficient moisture is available to support new growth (generally, spring is the best season, but check plant tags or consult with your local nursery for specific species).

## Practical turf areas

How and where turf is placed in the landscape can significantly reduce the amount of irrigation water needed to support the landscape. Lawns require a large amount of supplemental water and generally greater maintenance than other vegetation. Use turf where it aesthetically highlights the house or buildings and where it has practical function, such as in play or recreation areas. Grouping turf areas can increase watering efficiency and significantly reduce evaporative and runoff losses. Select a type of grass that can withstand drought periods and become dormant during hot, dry seasons. Reducing or eliminating turf areas altogether further reduces water use.

## Efficient irrigation

Efficient irrigation is a very important part of using water efficiently outdoors, and applies in any landscape—whether Xeriscape or conventional. For this reason, an entire section of this booklet addresses efficient irrigation; it can be found on page 6.

## Use of mulches

Mulches aid in greater retention of water by minimizing evaporation, reducing weed growth, moderating soil temperatures, and preventing erosion. Organic mulches also improve the condition of your soil as they decompose. Mulches are typically composed of wood bark chips, wood grindings, pine straws, nut shells, small



*Wine Cup (Callirhoe involucrata) and Sunset Hyssop (Agastache rupestris) in the Denver Water Xeriscape Garden*

gravel, or shredded landscape clippings. Avoid using rock mulches in sunny areas or around non-arid climate plants, as they radiate large amounts of heat and promote water loss that can lead to scorching. Too much mulch can restrict water flow to plant roots and should be avoided.

## Appropriate maintenance

Water and fertilize plants only as needed. Too much water promotes weak growth and increases pruning and mowing requirements. Like any landscape, a water-efficient yard will require regular pruning, weeding, fertilization, pest control, and irrigation. As your water-efficient landscape matures, however, it will require less maintenance and less water. Cutting turf grass only when it reaches two to three inches promotes deeper root growth and a more drought-resistant lawn. As a rule of thumb, mow your turf grass before it requires more than one inch to be removed. The proper cutting height varies, however, with the type of grass, so you should contact your county extension service or local nursery to find out the ideal cutting height for your lawn. Avoid shearing plants or giving them high nitrogen fertilizers during dry periods because these practices encourage water-demanding new growth.

# Water-efficient Landscape Irrigation Methods

With common watering practices, a large portion of the water applied to lawns and gardens is not absorbed by the plants. It is lost through evaporation, runoff, or being pushed beyond the root zone because it is applied too quickly or in excess of the plants' needs. The goal of efficient irrigation is to reduce these losses by applying only as much water as is needed to keep your plants healthy. This goal is applicable whether you have a Xeriscape or a conventional landscape.

To promote the strong root growth that supports a plant during drought, water deeply and only when the plant needs water. For clay soils, watering less deeply and more often is recommended. Irrigating with consideration to soil

type, the condition of your plants, the season, and weather conditions—rather than on a fixed schedule—significantly increases your watering efficiency. Grouping plants according to similar water needs also makes watering easier and more efficient.

Irrigating lawns, gardens, and landscapes can be accomplished either manually or with an automatic irrigation system. Manual watering with a hand-held hose tends to be the most water-efficient method. According to the AWWA Research Foundation's outdoor end use study, households that manually water with a hose typically use 33 percent less water outdoors than the average household. The study also showed that households with in-ground sprinkler systems used 35 percent more water, those with automatic timers used 47 percent more water, and those with drip irrigation systems used 16 percent more water than households without these types of systems. These results show that in-ground sprinkler and drip irrigation systems must be operated properly to be water-efficient.

You can use a hand-held hose or a sprinkler for manual irrigation. To reduce water losses from evaporation and wind, avoid sprinklers that produce a fine mist or spray high into the air. Soaker hoses can also be very efficient and effective when used properly. Use a hand-held soil moisture probe to determine when irrigation is needed.

To make automatic irrigation systems more efficient, install system controllers such as rain sensors that prevent sprinkler systems from turning on during and immediately after rainfall, or soil moisture sensors that activate sprinklers only when soil moisture levels drop below pre-programmed levels. You can also use a weather-



*Purple Fountain Grass (Pennisetum setaceum "Rubrum") and Marigolds (Calendula officinalis) in planter bed*



driven programming system. Drip-type irrigation systems are considered the most efficient of the automated irrigation methods because they deliver water directly to the plants' roots. It is also important to revise your watering schedule as the seasons change. Over-watering is most common during the fall when summer irrigation schedules have not been adjusted to the cooler temperatures.

To further reduce your water consumption, consider using alternative sources of irrigation water, such as gray water, reclaimed water, and collected rainwater. According to the AWWA Research Foundation, homes with access to alternative sources of irrigation reduce their water bills by as much as 25 percent.<sup>4</sup> Graywater is untreated household waste water from bathroom sinks, showers, bathtubs, and clothes washing machines. Graywater systems pipe this used water to a storage tank for later outdoor watering use. State and local graywater laws and policies vary, so you should investigate what qualifies as gray water and if any limitations or restrictions apply. Reclaimed water is waste water that has been treated to levels suitable for nonpotable uses. Check with local water officials to determine if it is available in your area. Collected rainwater is rainwater collected in cisterns, barrels, or storage tanks. Commercial rooftop collection systems are available, but simply diverting your downspout into a covered



*Red Valerian (Centranthus ruber)*

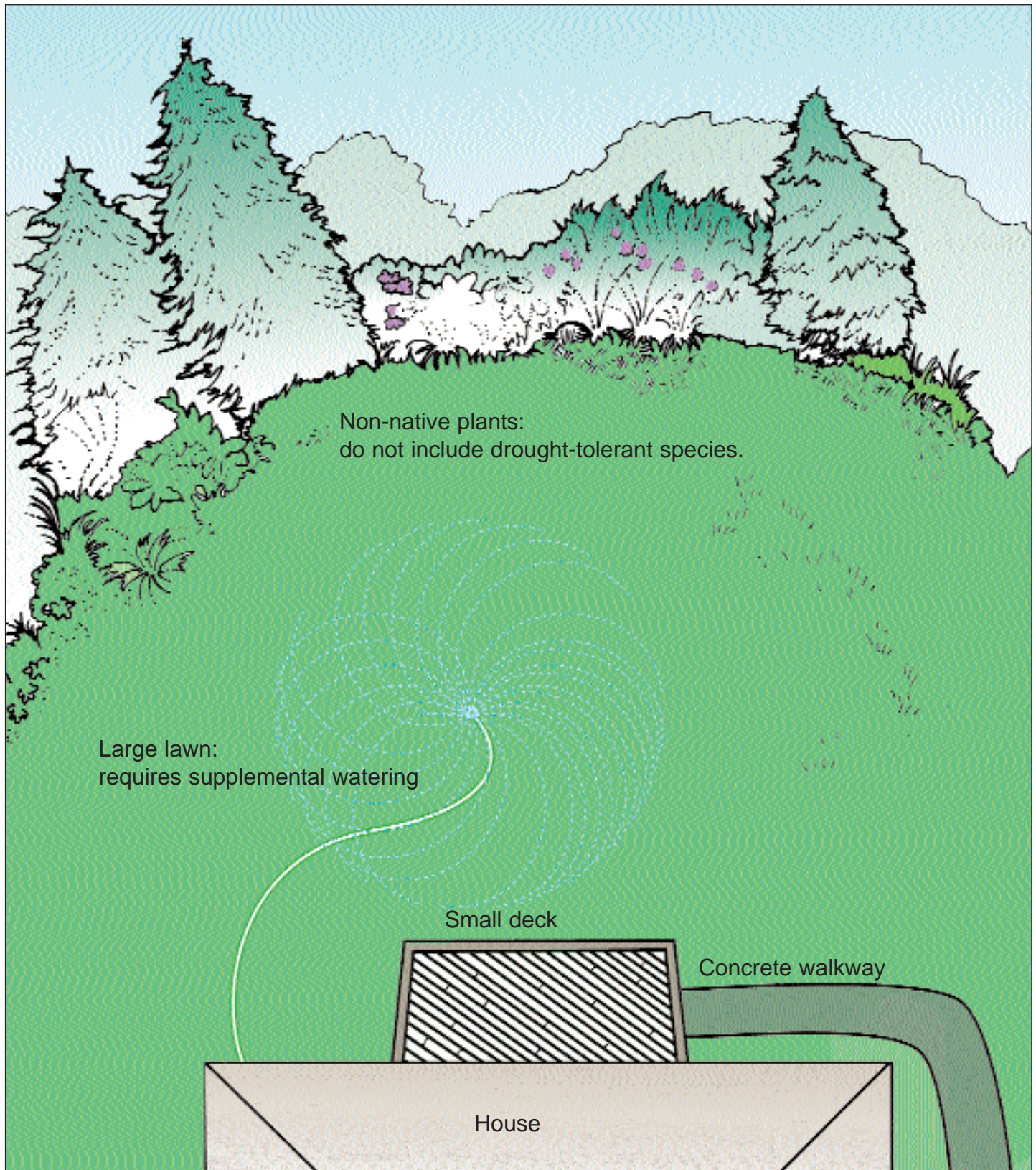
barrel is an easy, low-cost approach. When collecting rainwater, cover all collection vessels to prevent animals and children from entering and to prevent mosquito breeding. Some states might have laws which do not allow collection of rainwater, so be sure to check with your state's water resource agency before implementing a rainwater collection system.

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<sup>4</sup> AWWA Research Foundation. 1999. *Residential End Uses of Water*. <[www.waterwiser.org](http://www.waterwiser.org)>

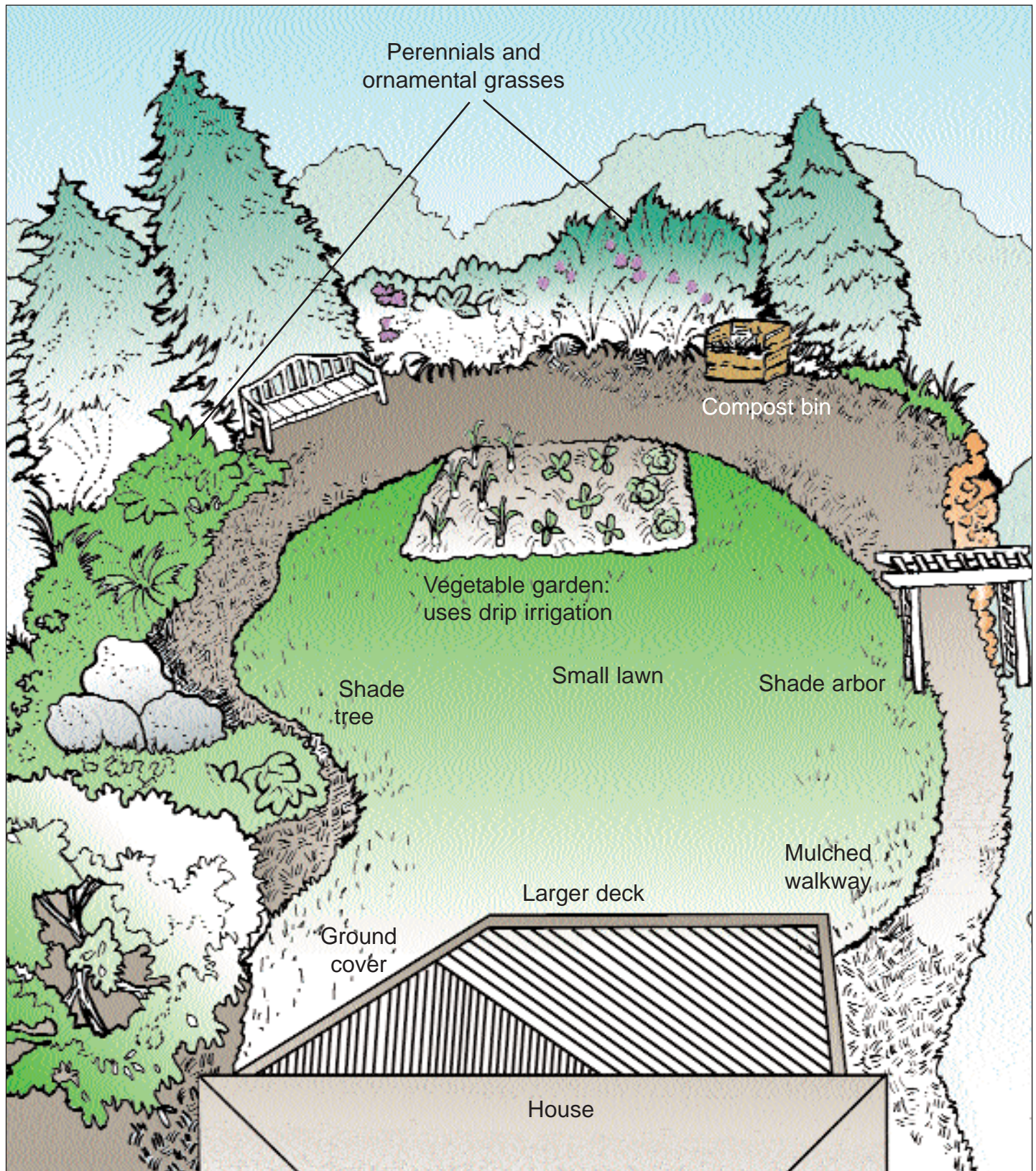


# Non-xeriscaping





# Xeriscaping





# Examples of Successful Water-efficient Landscaping Projects

**W**ater-efficient landscaping techniques can be used by individuals, companies, state, tribal, and local governments, and businesses to physically enhance their properties, reduce long-term maintenance costs, and create environmentally conscious landscapes. The following examples illustrate how water-efficient landscapes can be used in various situations.



*Oriental Poppies (Papaver orientale)*

## Homeowner–public/private partnership

- The South Florida Water Management District, the Florida Nurserymen and Growers Association, the Florida Irrigation Society, and local businesses worked together to produce a television video called “Plant It Smart with Xeriscape.” The video shows how a typical Florida residential yard can be retrofitted with Xeriscape landscaping to save energy, time,

and money. The showcase yard (selected from 70 applicants) had a history of heavy water use—more than 90,000 gallons per month. After the retrofit, the yard’s aesthetic value was enhanced; plus it now uses 75 percent less water and relies on yard trimmings for mulch and compost.

- The Southwest Florida Water Management District (SWFWMD), the City of St. Petersburg, and Pinellas County, Florida, produced a video called “Xeriscape It!” It shows a landscape being installed using the seven Xeriscape principles. The SWFWMD also funded several Xeriscape demonstration sites and maintains a Xeriscape demonstration garden at its Brooksville, Florida, headquarters. The garden features a variety of native and non-native plants and is available for public viewing, along with a landscape plant identification guide.
- Residents of Glendale, Arizona, can receive a \$100 cash rebate for installing or converting more than half of their landscapable area to non-grass vegetation. The Glendale Water Conservation Office conducts an inspection of the converted lawn to ensure compliance with rebate requirements and then issues a rebate check to the homeowner. The purpose of the Landscape Rebate Program is to permanently reduce the amount of water used to irrigate grass throughout Glendale.

## State government

- Although perceived as a water-rich state, Florida became the first to enact a statewide Xeriscape law. Florida’s legislature recognized that its growing population and vulnerable environment necessitated legal safeguards for its water resources. The Xeriscape law requires Florida’s Departments of Management Ser-



vices and Transportation to use Xeriscape landscaping on all new public properties and to develop a 5-year program to phase in Xeriscape on properties constructed before July 1992. All local governments must also consider requiring the use of Xeriscape and offering incentives to install Xeriscaping.

- Texas also developed legislation requiring Xeriscape landscaping on new construction projects on state property beginning on or after January 1994. Additional legislation, enacted in 1995, requires the Department of Transportation to use Xeriscape practices in the construction and maintenance of roadside parks. All municipalities may consider enacting ordinances requiring Xeriscape to conserve water.

## City government

In Las Vegas, Nevada, homeowners can receive up to \$1,000 for converting their lawn to Xeriscape, while commercial landowners can receive up to a \$50,000 credit on their water bill. The city and several other surrounding communities hope these eye-catching figures will help Las Vegas meet its goal of saving 25 percent of the water it would otherwise have used by the year 2010; to date, it has saved 17 percent. Local officials plan to reach the target with the assistance of incentive programs encouraging Xeriscape, a city ordinance limiting turf to no more than 50 percent of new landscapes, grassroots information programs, and a landscape awards program specifically for Xeriscaped properties. Preliminary results of a five-year study show that residents who converted a portion of their lawns to Xeriscape reduced total water consumption by an average of 33 percent. The xeric vegetation required less than a quarter of the water typically used and one-third the maintenance (both in labor and expenditures) compared to traditional turf.



*Yellow Ice Plant (Delosperma nubigenum) close-up*

## Developers

Howard Hughes Properties (HHP), a developer and manager of more than 25,000 acres of residential, commercial, and office development property, has enthusiastically used drought tolerant landscaping on all of its properties since 1990. Most of the company's properties are located in Las Vegas, one of the country's fastest growing metropolitan areas. To conserve resources, the city and county have implemented regulations requiring developers to employ certain Xeriscape principles in new projects. Specifically, a limited percentage of grass can be used on projects, and it must be kept away from streets. As the area's first large-scale developer to recognize the need and value in incorporating drought tolerant landscaping in parks, streetscapes, and open spaces, HHP uses native and desert-adaptive plants that survive and thrive in the Las Vegas climate with minimal to moderate amounts of water.

Drip system irrigation controllers are linked to weather stations that monitor the evapotranspiration rate. This allows HHP to determine the correct amount of water to be applied to plants at any given time. HHP tests the irrigation systems regularly and adds appropriate soil amendments to promote healthy plant growth. The maintenance program also includes pest management, the use of mulching mowers, and the use of rock mulch top dressing on all non-turf planting areas. These measures combine to ensure a beautiful, healthy, and responsible landscape.

## Public/private partnerships

Even the most water-conscious homeowners in Southern California are over-watering by 50 to

70 gallons per day. The excess water washes away fertilizers and pesticides, which pollute natural waterways. The quantity of water wasted (and the dollars that pay for it) are even more substantial for large-scale commercial properties and developments.

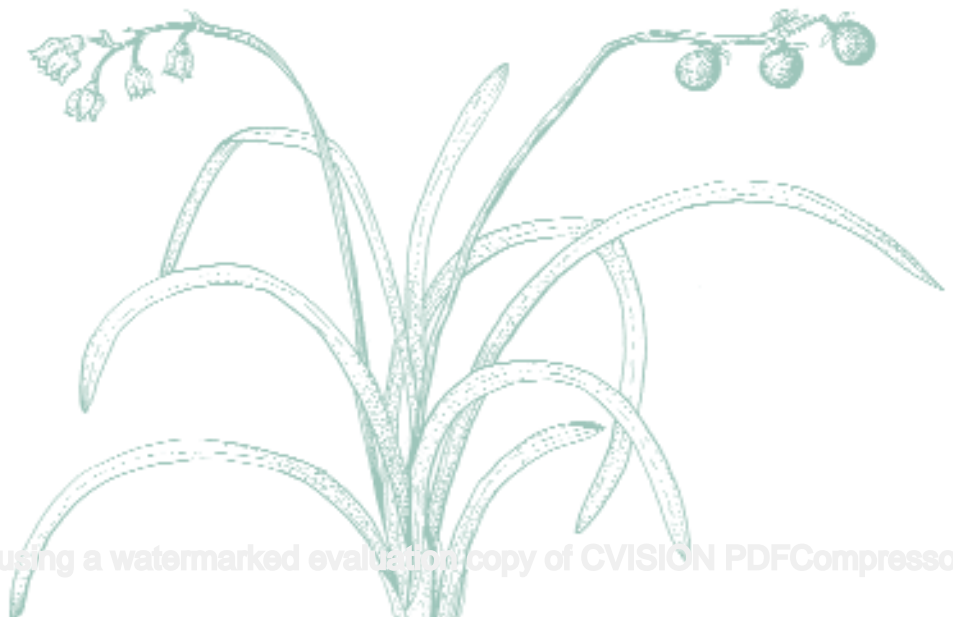
An innovative partnership in Orange County links landscape water management, green mate-

rial management, and non-point source pollution prevention goals into one program—the Landscape Performance Certification Program. This program emphasizes efficient landscape irrigation and features a “landscape irrigation budget” based on a property’s landscape area, type, and the daily weather. The Municipal Water District monitors actual water use through a system of 12,000 dedicated water meters installed by participating landscape managers.

Participants, including landscapers, property managers, and homeowner associations, can compare the actual cost of water used on their property with the calculated budget. Those staying within budget are awarded certification, a proven marketing tool. This new voluntary program is implemented by the Municipal Water District with input from the California Landscape Contractors’ Association, the Orange County Integrated Management Department, the Metropolitan Water District of Southern California, and local nurseries and has the support of 32 retailing water suppliers. The program is already credited with increasing the use of arid-climate shrubs and landscaping to accommodate drip irrigation, and has resulted in cost savings to water customers.



*Miscanthus sinensis*  
(Miscanthus grass, also called  
Maiden grass) variety with  
leaves turning yellow for fall.





# For More Information

The following list of organizations can provide more information on water-efficient landscaping. This is not meant to be an exhaustive list, rather it is intended to help you locate local information sources and possible technical assistance.

## Water Management Districts or Utilities

Your local water management district often can provide information on water conservation, including water efficient landscaping practices. Your city, town, or county water management district can be found in the Blue Pages section of your local phone book or through your city, town, or county's Web site if it has one. If you do not know your city, town, or county's Web site, check for a link on your state's Web site. URLs for state Web sites typically follow this format: <www.state.(two letter state abbreviation).us>.

## State/County Extension Services

Your state or county extension service is also an excellent source of information. Many extension services provide free publications and advice on home landscaping issues including tips on plant selection and soil improvement. Some also offer a soil analysis service for a nominal fee. Your county extension service can be found in the Blue Pages section of your local phone book under the county government section or through your county's Web site if it has one. The U.S. Department of Agriculture's Cooperative State Research, Education, and Extension Service ([www.reeusda.gov/statepartners/usa.htm](http://www.reeusda.gov/statepartners/usa.htm)) provides an online directory of land-grant universities which can help you locate your state extension service. Government Guide ([www.governmentguide.com](http://www.governmentguide.com)) is yet another online resource that might prove helpful in locating state or local agencies.

## Organizations

The following is a partial list of organizations located across the United States that provide helpful information on water-efficient landscaping.

### American Water Works Association (AWWA)

6666 West Quincy Avenue  
Denver, CO 80235

Telephone: 303 794-7711

and

1401 New York Avenue, NW, Suite 640  
Washington, DC 20005

Telephone: 202 628-8303

Web: <[www.awwa.org](http://www.awwa.org)>

### Arizona Municipal Water Users Association (AMWUA)

Web: <[www.amwua.org/program-xeriscape.htm](http://www.amwua.org/program-xeriscape.htm)>

### BASIN

City of Boulder Environmental Affairs  
P.O. Box 791

Boulder, CO 80306

Phone: 303 441-1964

E-mail: [basin@bcn.boulder.co.us](mailto:basin@bcn.boulder.co.us)

Web: <[bcn.boulder.co.us/basin/local/seven.html](http://bcn.boulder.co.us/basin/local/seven.html)>

### Denver Water

1600 West 12th Avenue  
Denver, CO 80204

Phone: 303 628-6000

Fax: 303 628-6199

TDDY: 303 534-4116

Office of Water Conservation hotline:  
303 628-6343

E-mail: [jane.earle@denverwater.org](mailto:jane.earle@denverwater.org)

Web: <[www.water.denver.co.gov/conservation/conservframe.html](http://www.water.denver.co.gov/conservation/conservframe.html)>

### New Mexico Water Conservation Program/Water Conservation Clearinghouse

P. O. Box 25102

Santa Fe, NM 87504

Phone: 800 WATER-NM

E-mail: [waternm@ose.state.nm.us](mailto:waternm@ose.state.nm.us)

Fax: 505 827-3813

Web: <[www.ose.state.nm.us/water-info/conservation/index.html](http://www.ose.state.nm.us/water-info/conservation/index.html)>

### Project WET - Water Education for Teachers

201 Culbertson Hall

Montana State University

Bozeman, MT 59717

Phone: 406 994-5392

Web: <[www.montana.edu/wwwwet](http://www.montana.edu/wwwwet)>

### Rocky Mountain Institute

1739 Snowmass Creek Road  
Snowmass, CO 81654-9199

Phone: 970 927-3851

Web: <[www.rmi.org](http://www.rmi.org)>



*Turkish Speedwell (Veronica liwanensis) in background and tulips in foreground.*

**Southern Nevada Water Authority**  
1001 S. Valley View Boulevard, Mailstop #440  
Las Vegas, NV 89153  
Phone: 702 258-3930  
Web: <www.snwa.com>

**Southwest Florida Water Management District**  
2379 Broad Street  
Brooksville, FL 34604-6899  
Phone: 352 796-7211 or 800 423-1476 (Florida only)  
Web: <www.swfwmd.state.fl.us/watercon/xeris/swfxeris.html>

**Sustainable Sources Green Building Program: Sustainable Building Source Book**  
E-mail: info@greenbuilder.com  
Web: <www.greenbuilder.com/sourcebook/xeriscape.html>

**Water Conservation Garden – San Diego County**  
12122 Cuyamaca College Drive West  
El Cajon, CA 92019  
Phone: 619 660-0614  
Fax: 619 660-1687

E-mail: info@thegarden.org  
Web: <www.thegarden.org/garden/xeriscape/index.html> and <www.sdcwa.org/manage/conservation-xeriscape.phtml>\

**WaterWiser: The Water Efficiency Clearing House**  
(Operated by AWWA in cooperation with the U.S. Bureau of Reclamation)  
6666 West Quincy Avenue  
Denver, CO 80235  
Phone: 800 559-9855  
Fax: 303 794-6303  
E-mail: bewiser@waterwiser.org  
Web: <www.waterwiser.org>

**Xeriscape Colorado!, Inc.**  
P.O. Box 40202  
Denver, CO 80204-0202  
Web: <www.xeriscape.org>

## Resources

The following is a partial list of publications on resource efficient landscaping. For even more information, particularly on plants suited to your locale, consult your local library, county extension service, nursery, garden clubs, or water utility.

Ball, Ken and American Water Works Association Water Conservation Committee. *Xeriscape Programs for Water Utilities*. Denver: American Water Works Association, 1990.

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Johnson, Eric and Scott Millard. *The Low-Water Flower Gardener: 270 Unthirsty Plants for Color, Including Perennials, Ground Covers, Grasses & Shrubs*. Tucson: Ironwood Press, 1993.

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Nellis, David W. *Seashore Plants of South Florida and the Caribbean: A Guide to Identification and Propagation of Xeriscape Plants*. Sarasota: Pineapple Press, Inc., 1994.

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- Winger, David, ed. *Xeriscape Color Guide*. Golden: Fulcrum Publishing, 1998.
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### **For copies of this publication contact:**

EPA Water Resources Center (RC-4100)  
U.S. Environmental Protection Agency  
Ariel Rios Building, 1200 Pennsylvania Avenue, NW.  
Washington, DC 20460

### **For more information regarding water efficiency, please contact:**

Water Efficiency Program (4204M)  
U.S. Environmental Protection Agency  
Ariel Rios Building, 1200 Pennsylvania Avenue, NW.  
Washington, DC 20460  
<[www.epa.gov/OWM/water-efficiency/index.htm](http://www.epa.gov/OWM/water-efficiency/index.htm)>



United States  
Environmental Protection Agency (4204M)  
Washington, DC 20460

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